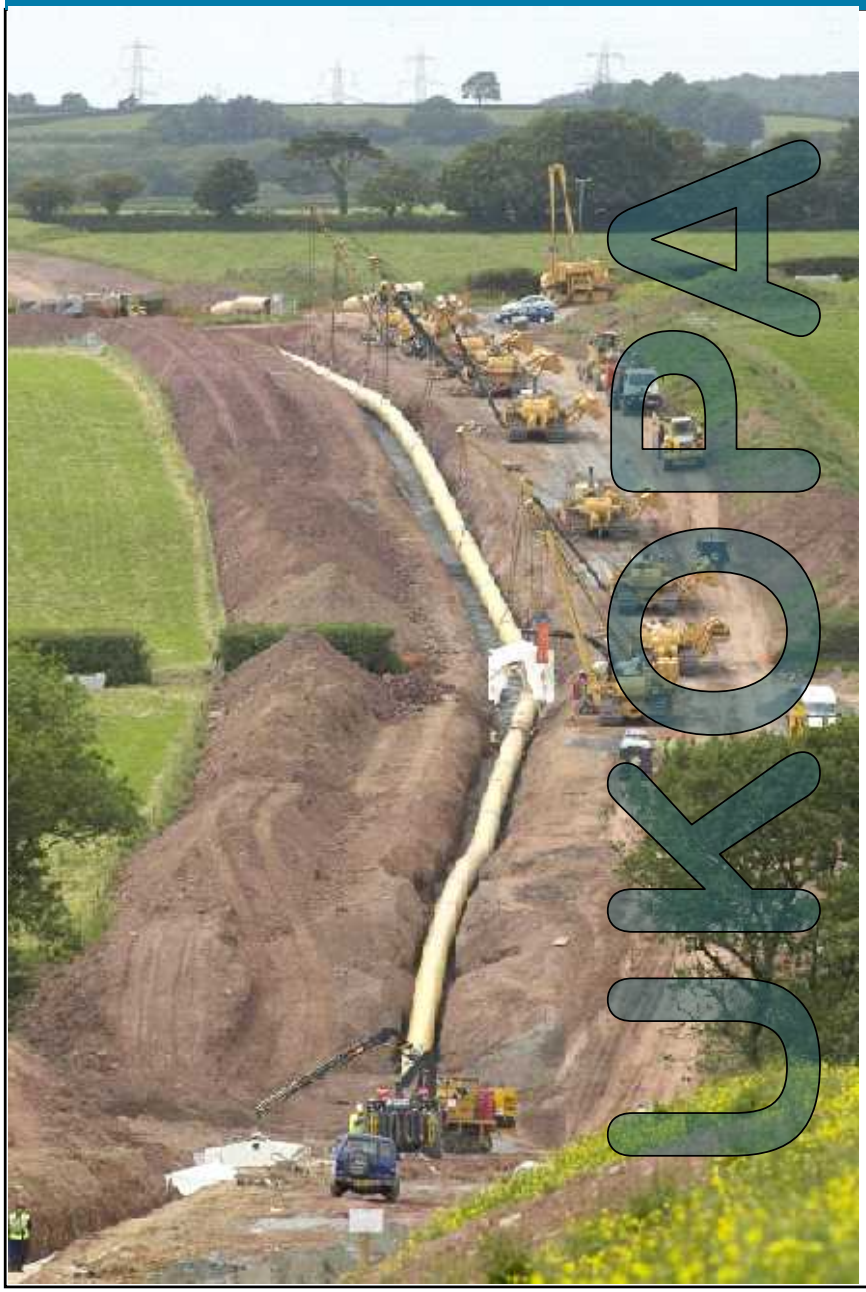
UKOPA

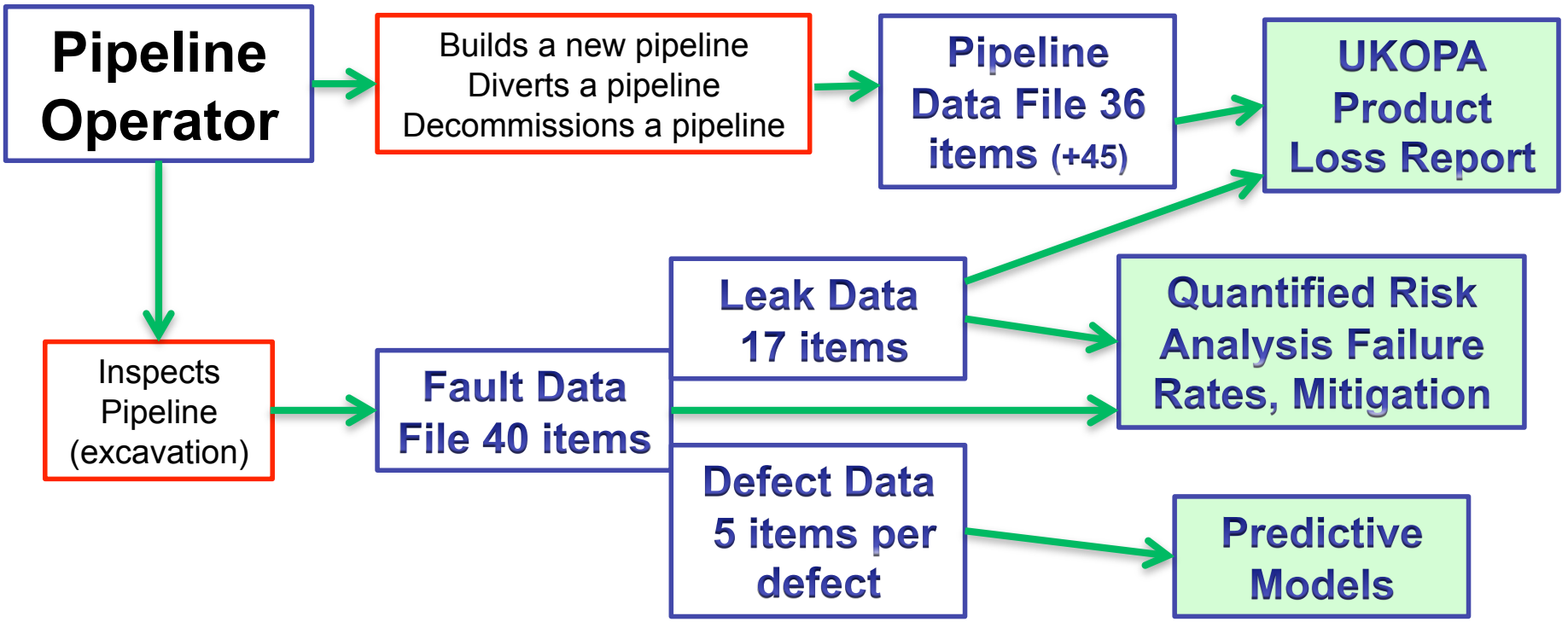
United Kingdom Onshore Pipeline Operators' Association



FDMG – Excel-based Database
How IT Works
1962-2010 Product Loss Report

October 2011

Excel-based Fault and Leak Database



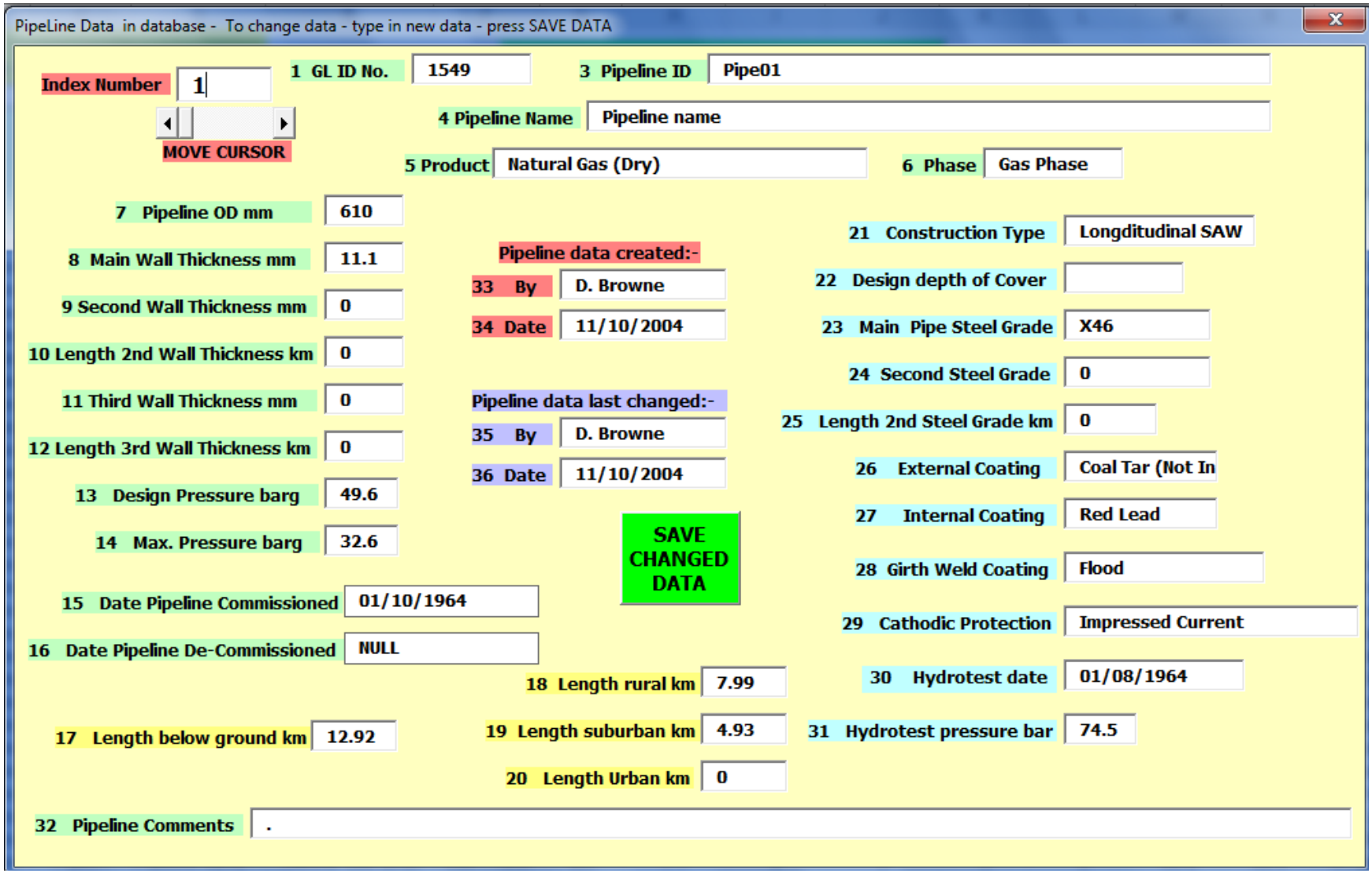
A FAULT is a feature that has been confirmed by field investigation, excavation and measurement. Any features that are inferred by other measurements such an intelligent pig in line inspections, CIPS, etc and have not been verified in the field should not be included. However pipeline defects comprising of coating damage or grinding marks confirmed by inspection should be included. The date of the fault should be the date of the field inspection.

Data Format – Pipeline Data

Database - Pipeline Operator List of Pipelines Press to view database and change data

2	3	4	5	6	7	8	9	10	11	12	13	14	15
Pipeline Operator	Operator's pipeline reference number	Operator's pipeline name	Product	Phase	Outside Diameter mm	MAIN Nominal Wall Thickness mm	Nominal Wall Thickness 2 - mm	Length of pipeline with wall thickness 2 - km	Nominal Wall Thickness 3 - mm	Length of pipeline with wall thickness 3 - km	Pipeline Design Pressure Bar	Pipeline Max Operating Pressure Bar	Date Pipeline was Commissioned
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	610	11.1	0	0	0	0	49.6	32.6	01 October 1964
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	325	6.4	0	0	0	0	49.6	32.6	01 October 1964
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	325	7.1	0	0	0	0	68.9	68.9	01 September 1970
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	325	7.9	0	0	0	0	49.6	32.6	01 October 1970
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	325	6.4	11.9	0.21	0	0	49.6	32.6	01 February 1969
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	218	6.4	0	0	0	0	49.6	13.8	01 May 1968
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	457	9.5	0	0	0	0	49.6	32.6	01 December 1966
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	356	7.9	0	0	0	0	49.6	32.6	01 December 1966
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	274	7.1	0	0	0	0	49.6	13.8	01 December 1966
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	274	6.4	0	0	0	0	49.6	32.6	01 December 1964
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	325	6.4	0	0	0	0	49.6	32.6	01 December 1964
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	356	7.9	0	0	0	0	49.6	24.1	01 January 1968
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	508	9.5	0	0	0	0	49.6	33.8	01 January 1968
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	356	7.9	0	0	0	0	49.6	6.9	01 July 1968
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	508	11.1	0	0	0	0	49.6	33.8	01 January 1968
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	508	9.5	0	0	0	0	49.6	13.8	01 December 1966
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	325	7.9	0	0	0	0	49.6	13.8	01 December 1966
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	325	7.9	0	0	0	0	49.6	13.8	01 January 1967
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	325	7.9	0	0	0	0	49.6	32.6	01 January 1967
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	325	6.4	0	0	0	0	49.6	32.6	01 October 1968
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	325	6.4	0	0	0	0	49.6	32.6	01 November 1969
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	76	6.4	0	0	0	0	49.6	17.2	01 September 1969
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	168	6.4	0	0	0	0	49.6	17.2	01 September 1969
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	76	6.4	0	0	0	0	49.6	17.2	01 September 1969
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	274	7.1	0	0	0	0	49.6	31	01 August 1971
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	168	6.4	12.7	0.081	0	0	49.6	36.4	01 June 1971
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	218	6.4	0	0	0	0	49.6	36.4	01 October 1970
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	325	7.1	0	0	0	0	49.6	36.4	01 January 1971
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	356	7.9	0	0	0	0	49.6	24.1	01 June 1974
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	218	6.4	0	0	0	0	49.6	36.4	01 May 1973
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	168	5.6	0	0	0	0	49.6	13.8	01 April 1974
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	325	7.1	0	0	0	0	49.6	13.8	01 December 1973
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	356	7.9	0	0	0	0	49.6	24.1	01 August 1974
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	168	6.4	0	0	0	0	49.6	13.8	01 June 1971
Pipeline Operator	Pipe01	Pipeline name	Natural Gas (Dry)	Gas Phase	168	4.8	0	0	0	0	49.6	31	01 September 1971

Pipeline Data Format – FORMS Format

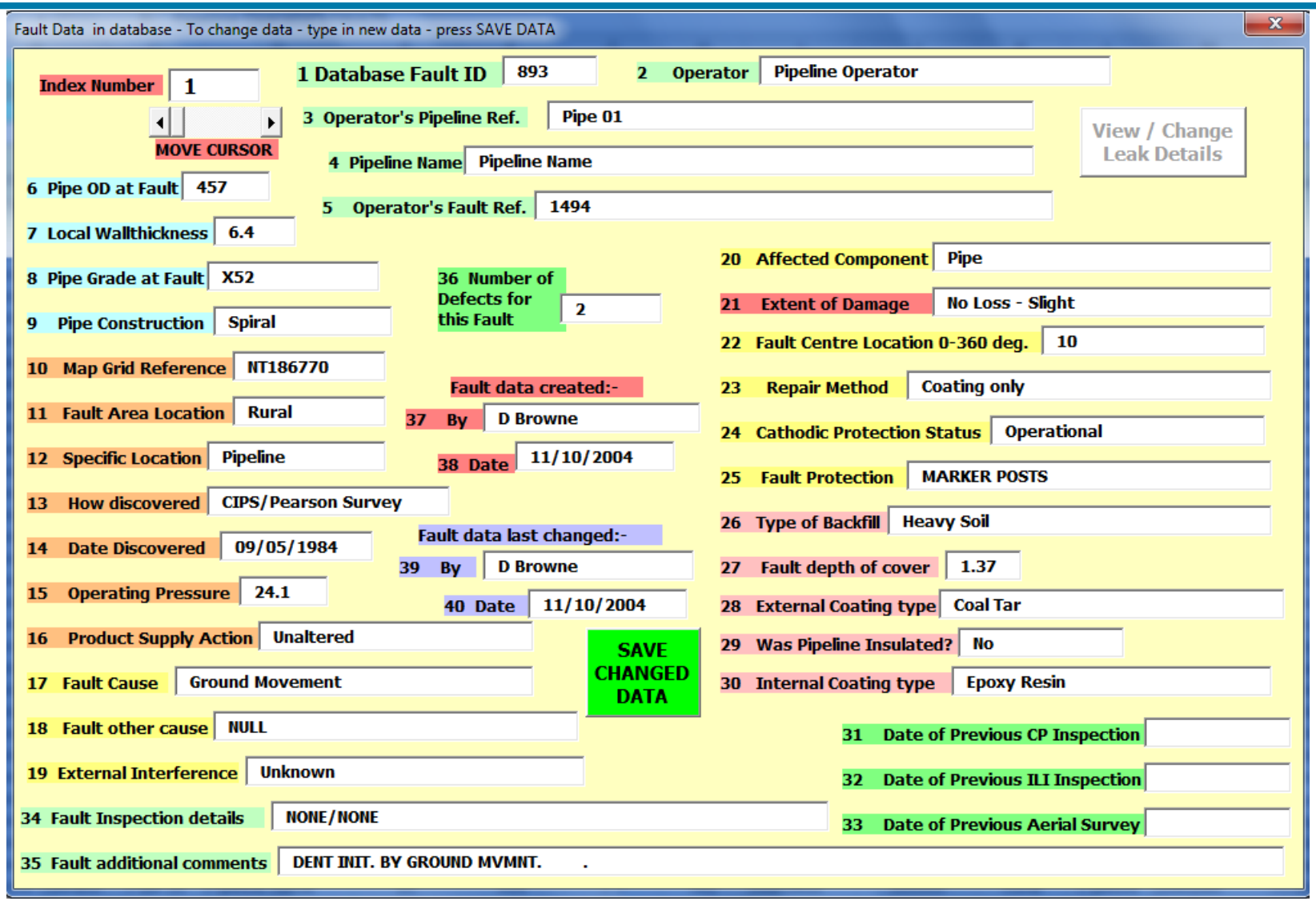


Data Format – Fault Data

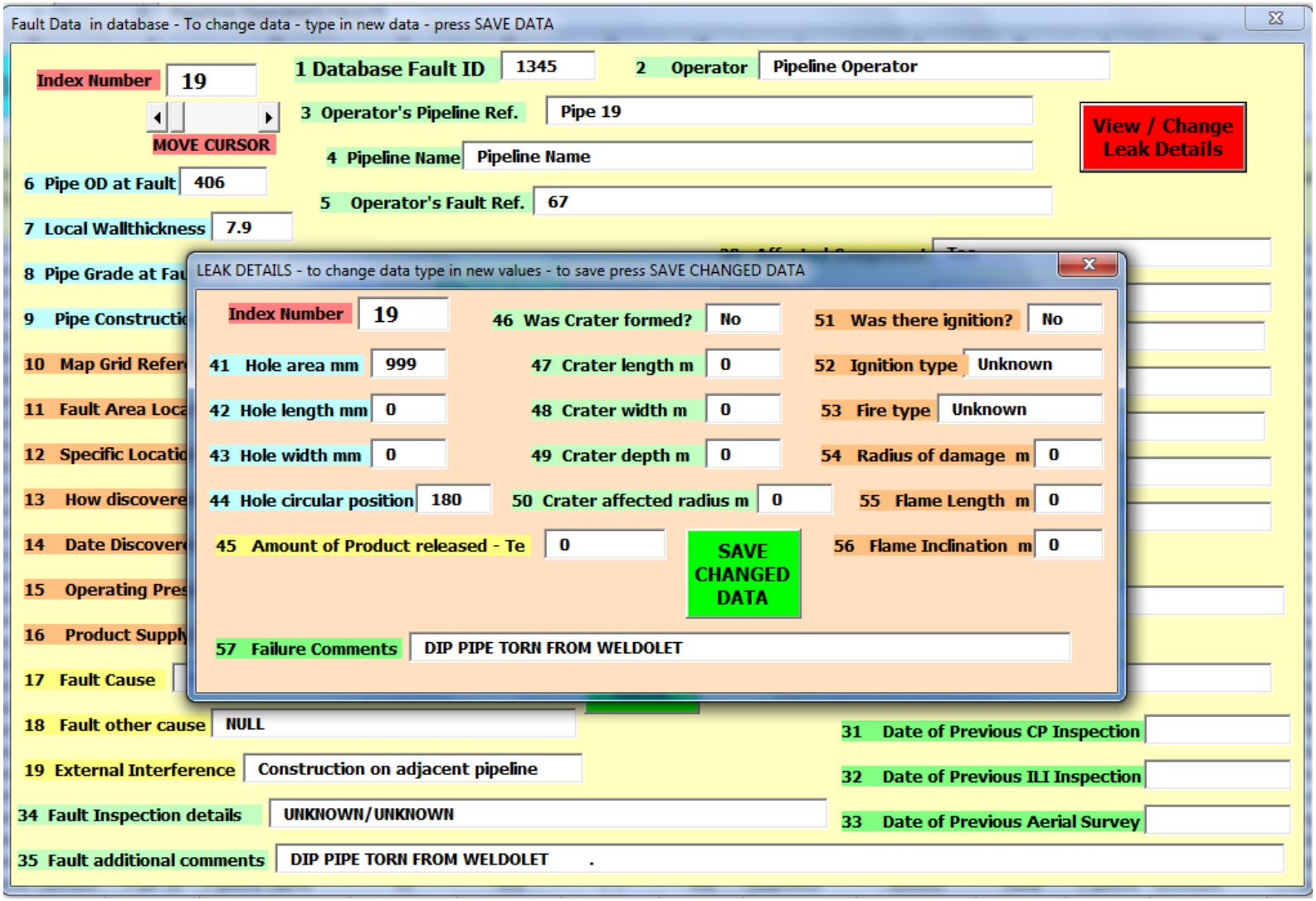
Pipeline Operator's FAULTS November 2010 View / Change Fault Data

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Original GL ID Fault Number	Pipeline Operator	Operator's pipeline reference number	Operator's pipeline name	Operator's fault reference number	Pipe Outside Diameter at Fault mm	Local Wall Thickness mm	Fault Material Grade	Type of Pipe Construction at Fault	Ordnance Survey Grid at Fault	Fault Pipeline Location	Fault Specific Location	How Fault was Discovered	Fault Discovery Date
893	Pipeline Operator	Pipe 01	Pipeline Name	1494	457	6.4	X52	Spiral	NT186770	Rural	Pipeline	S/Pearson Sur	09 May 1984
894	Pipeline Operator	Pipe 02	Pipeline Name	1609	457	7.1	X52	Spiral	NS056777	Rural	Pipeline	Other	10 October 1985
895	Pipeline Operator	Pipe 03	Pipeline Name	1610	457	7.1	X52	Spiral	NS056777	Rural	Pipeline	Other	29 October 1985
1330	Pipeline Operator	Pipe 04	Pipeline Name	1947	914	12.7	X60	Longditudinal S	SU247368	Rural	Pipeline	OLI	24 April 1989
1331	Pipeline Operator	Pipe 05	Pipeline Name	1954	914	12.7	X60	Longditudinal S	SU228394	Rural	Pipeline	OLI	24 April 1989
1332	Pipeline Operator	Pipe 06	Pipeline Name	1709	406	7.9	B	Seamless	SU422213	Unknown	Pipeline	Ground Patrol	21 November 1986
1333	Pipeline Operator	Pipe 07	Pipeline Name	391	406	7.9	X42	Seamless	999999	Urban	Pipeline	Unknown	01 February 1973
1334	Pipeline Operator	Pipe 08	Pipeline Name	58	406	7.9	X42	Seamless	999999	Rural	Pipeline	Site Contractor	14 May 1968
1335	Pipeline Operator	Pipe 09	Pipeline Name	460	610	9.5	X46	Longditudinal S	999999	Rural	Pipeline	Air Patrol	18 September 1973
1336	Pipeline Operator	Pipe 10	Pipeline Name	2188	610	9.5	X46	Longditudinal S	999999	Rural	Pipeline	OLI	05 April 1993
1337	Pipeline Operator	Pipe 11	Pipeline Name	63	610	11.9	X52	Longditudinal S	999999	Suburban	Pipeline	Site Contractor	16 January 1970
1338	Pipeline Operator	Pipe 12	Pipeline Name	1661	610	11.9	X52	Longditudinal S	999999	Suburban	Pipeline	Public	18 September 1985
1339	Pipeline Operator	Pipe 13	Pipeline Name	2024	610	11.9	X52	Longditudinal S	999999	Rural	Pipeline	CIPS/Pearson	04 September 1990
1340	Pipeline Operator	Pipe 14	Pipeline Name	2025	610	11.9	X52	Longditudinal S	999999	Suburban	Pipeline	CIPS/Pearson	14 August 1990
1341	Pipeline Operator	Pipe 15	Pipeline Name	2026	610	11.9	X52	Longditudinal S	999999	Suburban	Pipeline	CIPS/Pearson	07 August 1990
1342	Pipeline Operator	Pipe 16	Pipeline Name	2027	610	11.9	X52	Longditudinal S	999999	Suburban	Pipeline	CIPS/Pearson	06 August 1990
1343	Pipeline Operator	Pipe 17	Pipeline Name	2131	610	11.9	X52	Longditudinal S	999999	Rural	Pipeline	CIPS/Pearson	17 November 1992
1344	Pipeline Operator	Pipe 18	Pipeline Name	66	406	7.9	B	Seamless	999999	Rural	Pipeline	Unknown	18 November 1968
1345	Pipeline Operator	Pipe 19	Pipeline Name	67	406	7.9	B	Seamless	999999	Rural	Pipeline	Unknown	31 October 1968
1346	Pipeline Operator	Pipe 20	Pipeline Name	779	406	7.9	B	Seamless	999999	Suburban	Pipeline	Ground Patrol	26 June 1979
1347	Pipeline Operator	Pipe 21	Pipeline Name	1173	406	7.9	B	Seamless	999999	Rural	Pipeline	Ground Patrol	19 November 1982
1348	Pipeline Operator	Pipe 22	Pipeline Name	1865	406	7.9	B	Seamless	999999	Rural	Pipeline	CIPS/Pearson	02 March 1988
1349	Pipeline Operator	Pipe 23	Pipeline Name	1866	406	7.9	B	Seamless	999999	Rural	Pipeline	CIPS/Pearson	30 March 1988
1350	Pipeline Operator	Pipe 24	Pipeline Name	778	406	7.9	B	Seamless	999999	Rural	Pipeline	Ground Patrol	24 May 1979
1351	Pipeline Operator	Pipe 25	Pipeline Name	918	406	7.9	B	Seamless	999999	Rural	Pipeline	Ground Patrol	04 November 1981
1352	Pipeline Operator	Pipe 26	Pipeline Name	1533	406	7.9	B	Seamless	999999	Rural	Pipeline	CIPS/Pearson	11 June 1984
1353	Pipeline Operator	Pipe 27	Pipeline Name	60	508	7.1	X42	Longditudinal S	999999	Rural	Pipeline	Site Contractor	19 August 1968
1354	Pipeline Operator	Pipe 28	Pipeline Name	348	508	7.1	X42	Longditudinal S	999999	Rural	Pipeline	Site Contractor	16 November 1971
1355	Pipeline Operator	Pipe 29	Pipeline Name	1662	508	7.1	X42	Longditudinal S	999999	Rural	Pipeline	Public	10 April 1986
1356	Pipeline Operator	Pipe 30	Pipeline Name	69	406	7.1	X42	Seamless	999999	Rural	Pipeline	Unknown	11 November 1970
1357	Pipeline Operator	Pipe 31	Pipeline Name	397	406	7.9	X42	Seamless	999999	Rural	Pipeline	Site Contractor	23 March 1973
1358	Pipeline Operator	Pipe 32	Pipeline Name	56	610	9.5	X46	Longditudinal S	999999	Rural	Pipeline	Unknown	24 February 1970
1359	Pipeline Operator	Pipe 33	Pipeline Name	64	610	9.5	X46	Longditudinal S	999999	Rural	Pipeline	Unknown	01 September 1969
1360	Pipeline Operator	Pipe 34	Pipeline Name	396	610	9.5	X46	Longditudinal S	999999	Rural	Pipeline	Site Contractor	29 March 1973
1361	Pipeline Operator	Pipe 35	Pipeline Name	2228	610	9.5	X46	Longditudinal S	999999	Rural	Pipeline	Site Contractor	11 July 1994

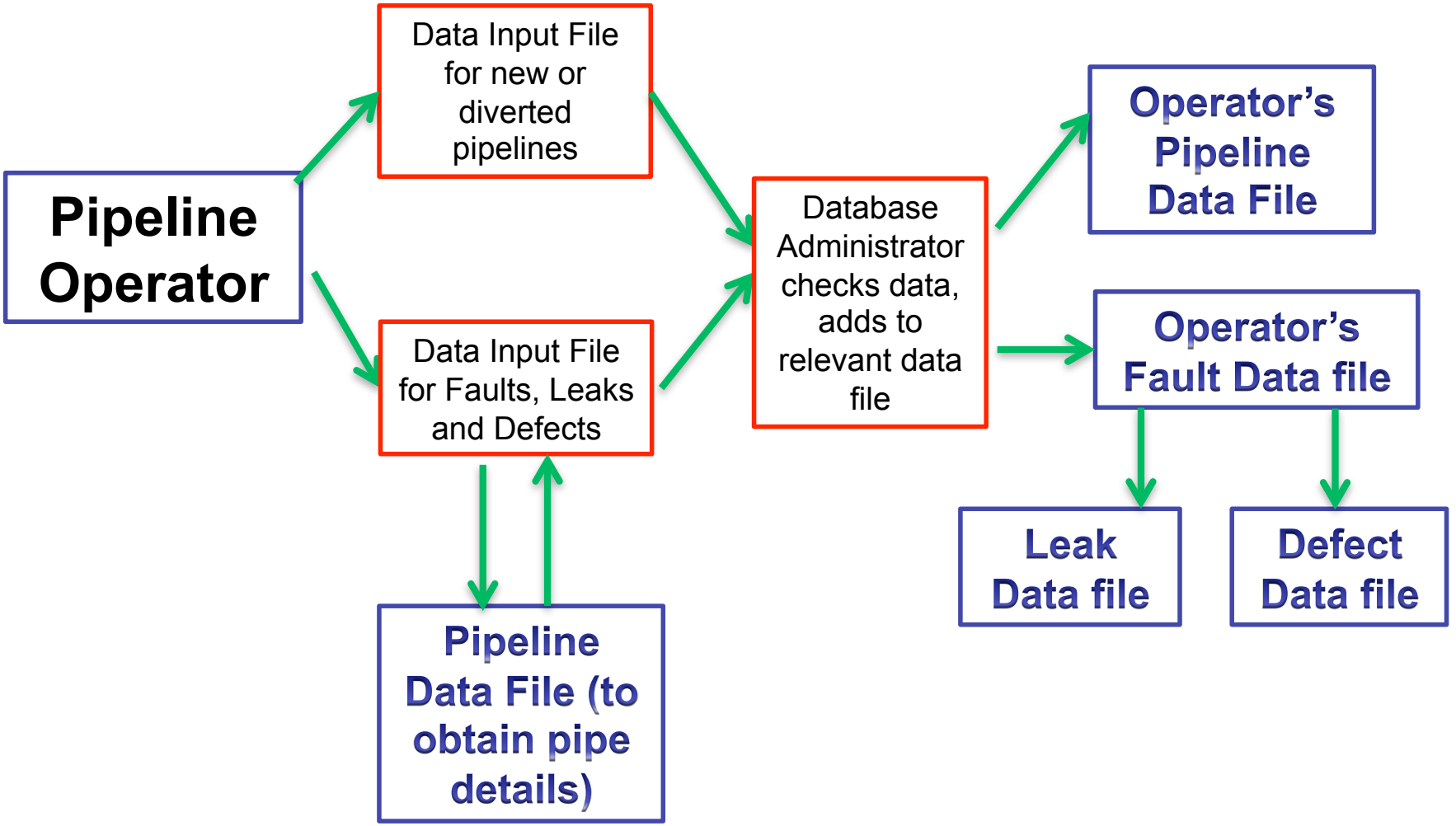
Data Format – Fault Data

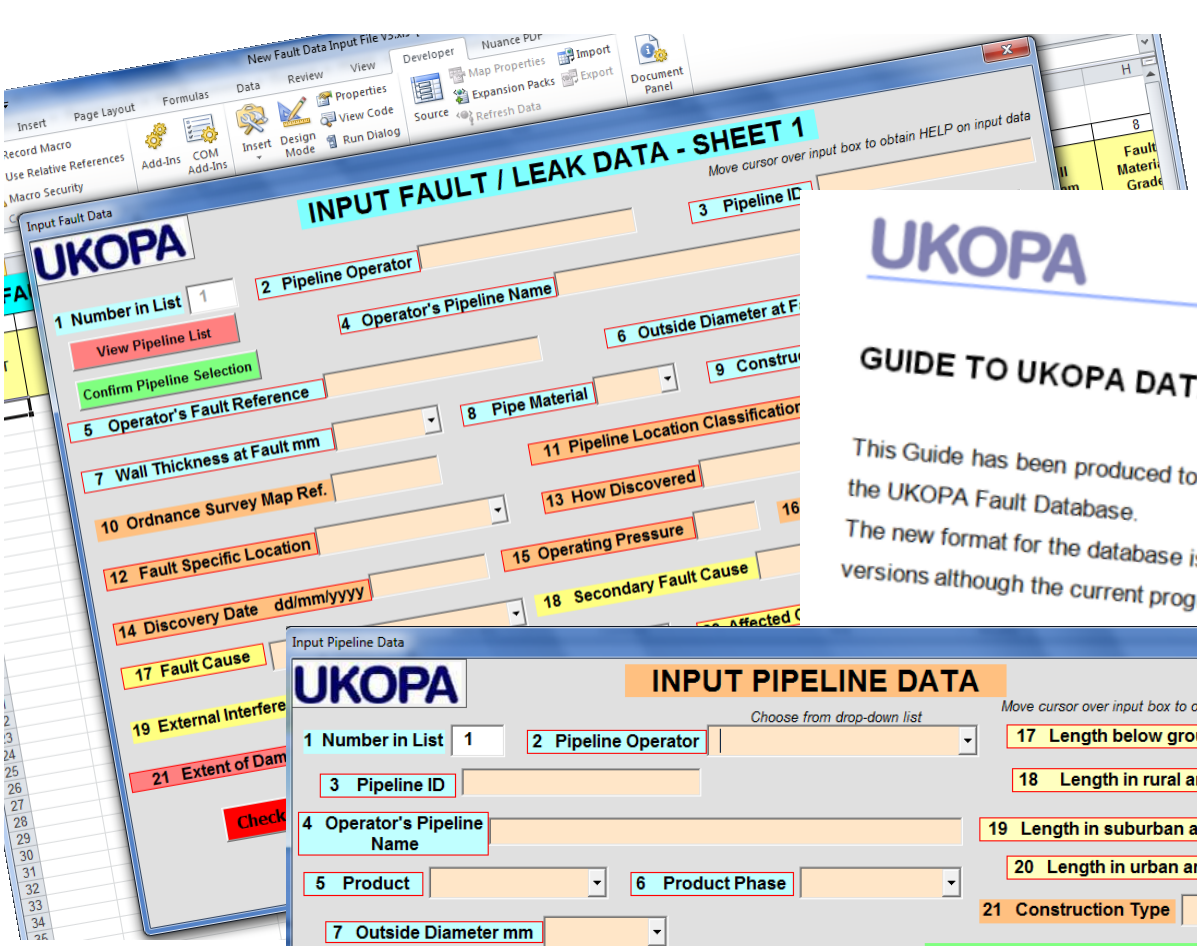


Data Format – Leak Data



Data Input


Pipeline Operator
Data Input File for new or diverted pipelines
Data Input File for Faults, Leaks and Defects
Pipeline Data File (to obtain pipe details)
Database Administrator checks data, adds to relevant data file
Operator's Pipeline Data File
Operator's Fault Data file
Leak Data file
Defect Data file



UKOPA

United Kingdom Onshore Pipeline Operators' Association

GUIDE TO UKOPA DATABASE FAULT DATA INPUT SPREADSHEET

24 August 2011

This Guide has been produced to assist UKOPA Fault Database members to add new fault data to the UKOPA Fault Database.

The new format for the database is Microsoft Excel – the programs work in 2003, 2007 and 2010 versions although the current programs were written in the 2003 version.

efined as a major accident hazard
and any associated equipment outside
e reduction station, compressor, etc)

ld investigation, excavation and
r measurements such an intelligent
verified in the field should not be
ting damage or grinding marks
of the fault should be the date of the

ELINE DATA AND FAULT DATA

Data Input Forms and Guidance

UKOPA

Pipeline Product Loss Incidents

(1962 - 2010)

Draft 7th Report of the UKOPA **F**ault **D**atabase **M**anagement **G**roup

Comprising:

National Grid
BP
Ineos
Sabic
Shell UK Limited
Shell EPE
E-ON UK
Wales & West Utilities
Scotia Gas Networks
Northern Gas Networks
Health and Safety Executive

Report prepared by R A McConnell & Dr J V Haswell for FDMG

Headline Results

Overall failure frequency 1962 to 2010 = **0.234** incidents per 1000 km.year
Pevious report 1962 to 2008 = 0.242

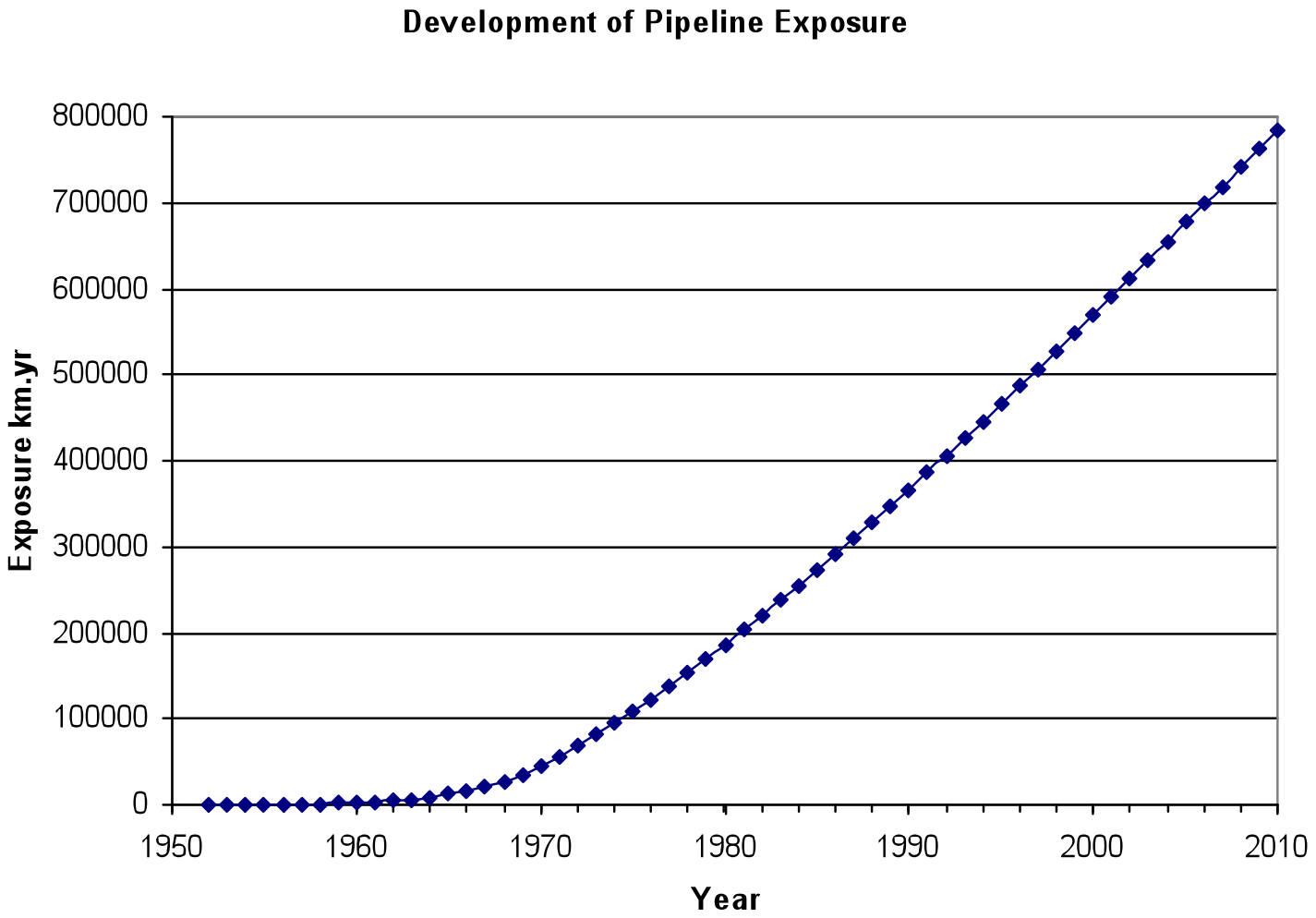
Failure frequency over the last 5 years = **0.093** incidents per 1000 km.year
Previous report 192004-2008 = 0.064

Total Pipeline length in operation end 2010 = 22,370 km

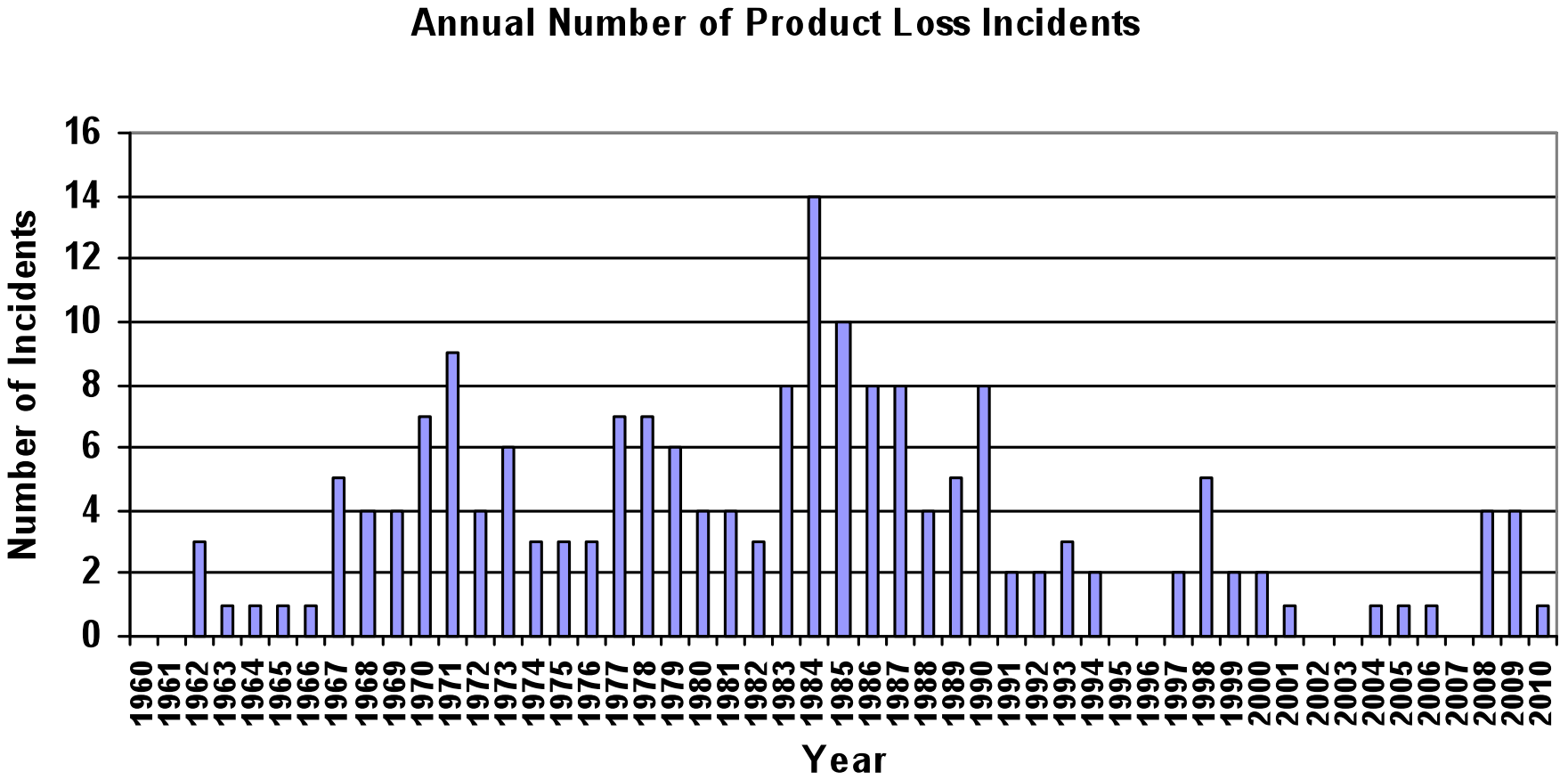
Total Exposure (km.years) to end 2010 = 785,385 km.years

Natural Gas (Dry)	21,053	Propylene	36.3
Ethylene	1,153	Condensate	24.0
Natural Gas Liquids	225.8	Propane	19.5
Crude Oil (Spiked)	212.6	Butane	19.5
Ethane	38.1	**TOTAL**	**22,370**

Exposure

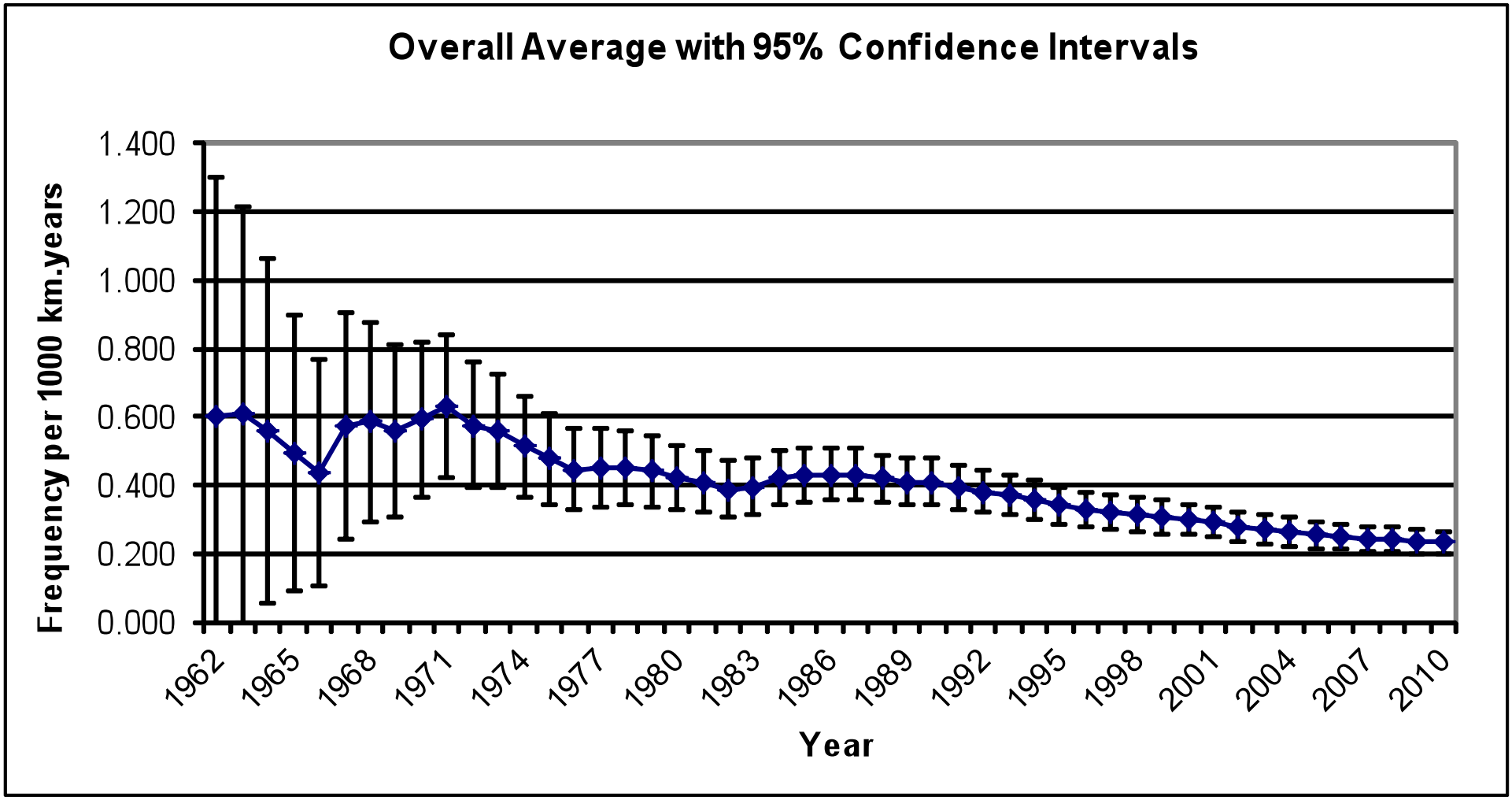

Development of Pipeline Exposure
Exposure km.yr
800000
700000
600000
500000
400000
300000
200000
100000
0
1950
1960
1970
1980
1990
2000
2010
Year

Product Loss Incidents

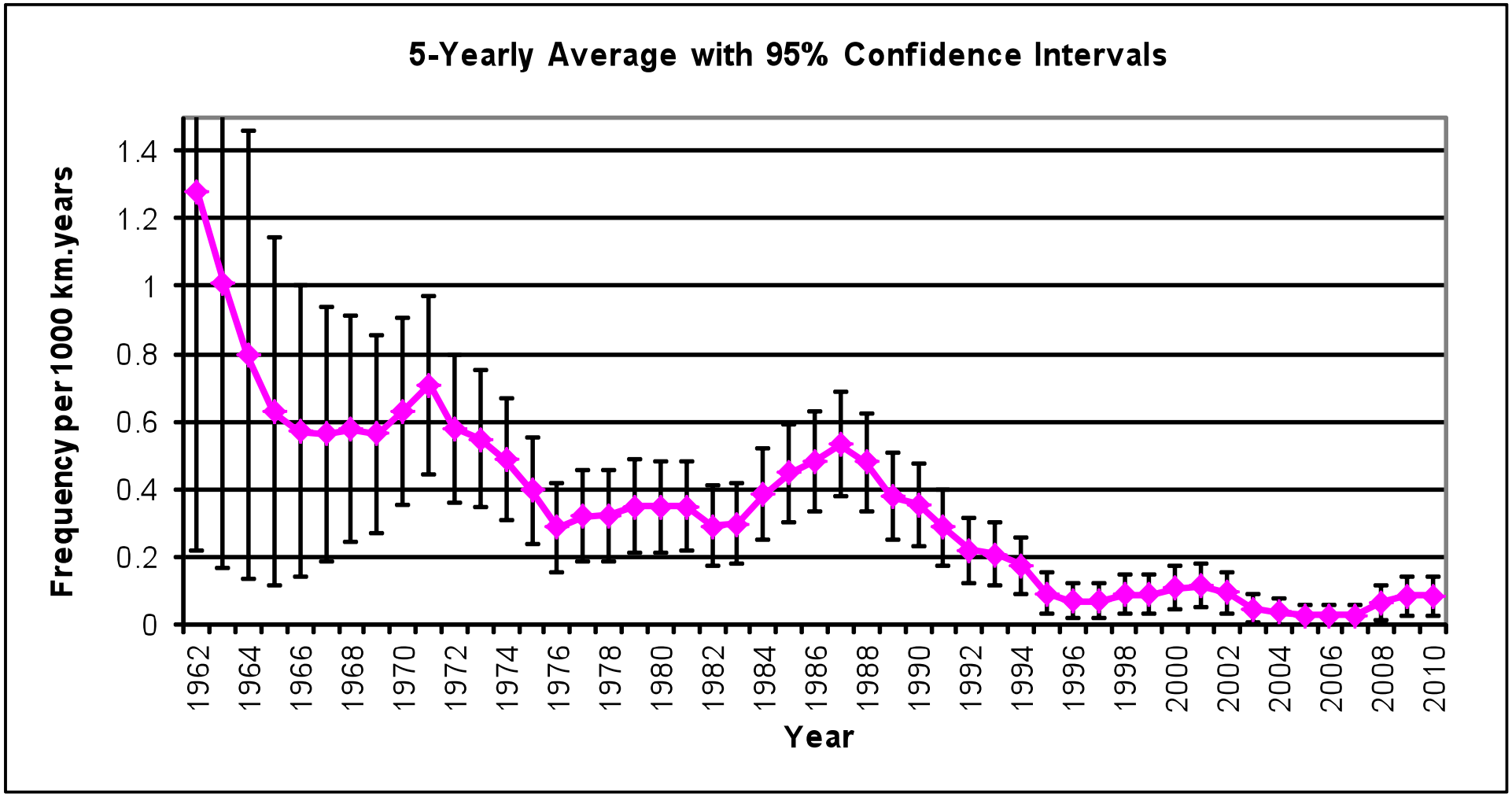


4 in 2009,	2 x External Interference (6-20mm and 20-40mm)
	1 x Other (0-6mm),
	1 x External Corrosion (6-20mm)
1 in 2010	1 x External Corrosion (0-6mm)

Overall Failure Rate



5-yearly Failure Rate



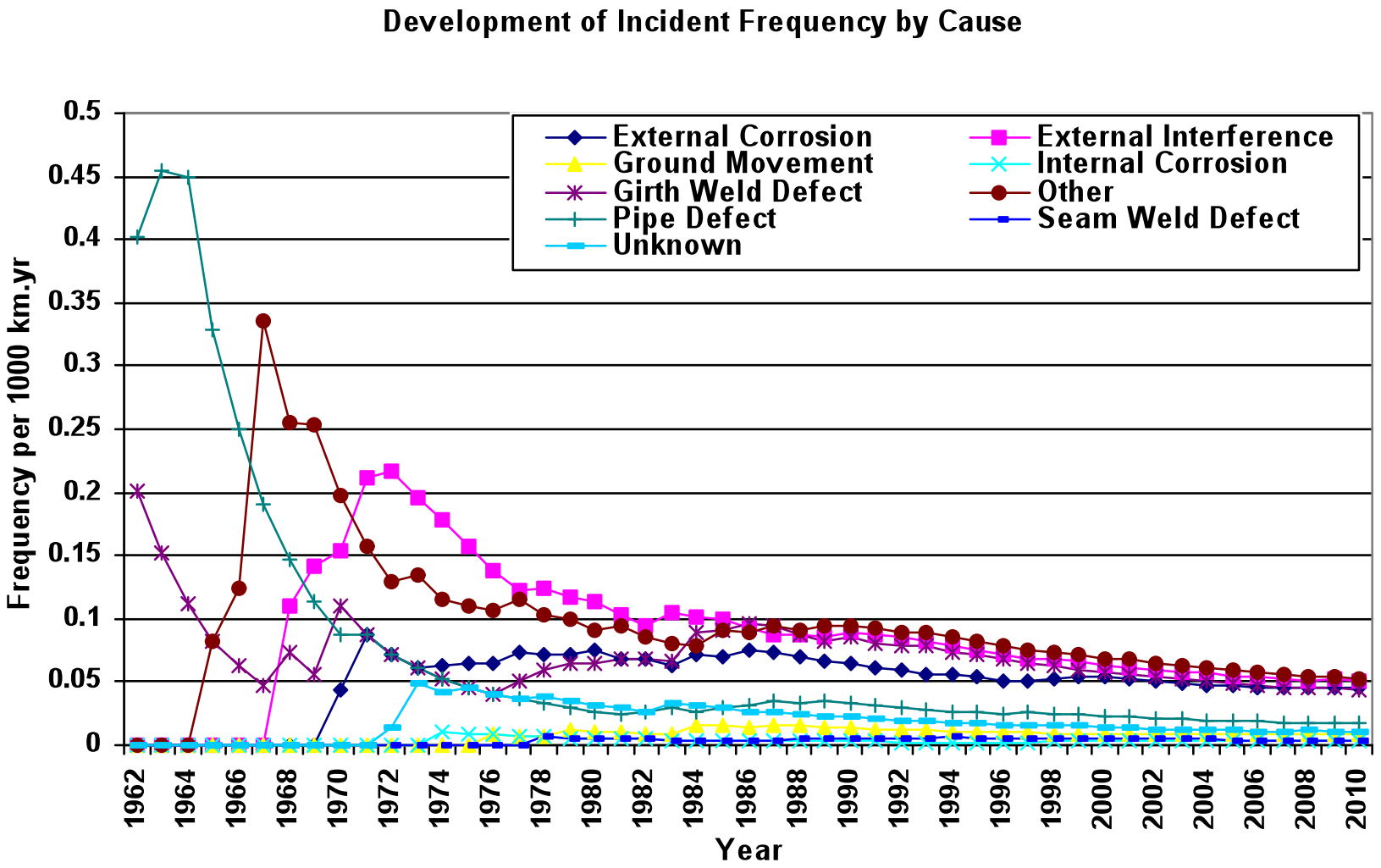
Leak Causes

Product Loss Cause	No. of Incidents
Girth Weld Defect	34
External Interference	40
Internal Corrosion	2
External Corrosion	37
Unknown	7
Other	41
Pipe Defect	13
Ground Movement	7
Seam Weld Defect	3
Total	**184**

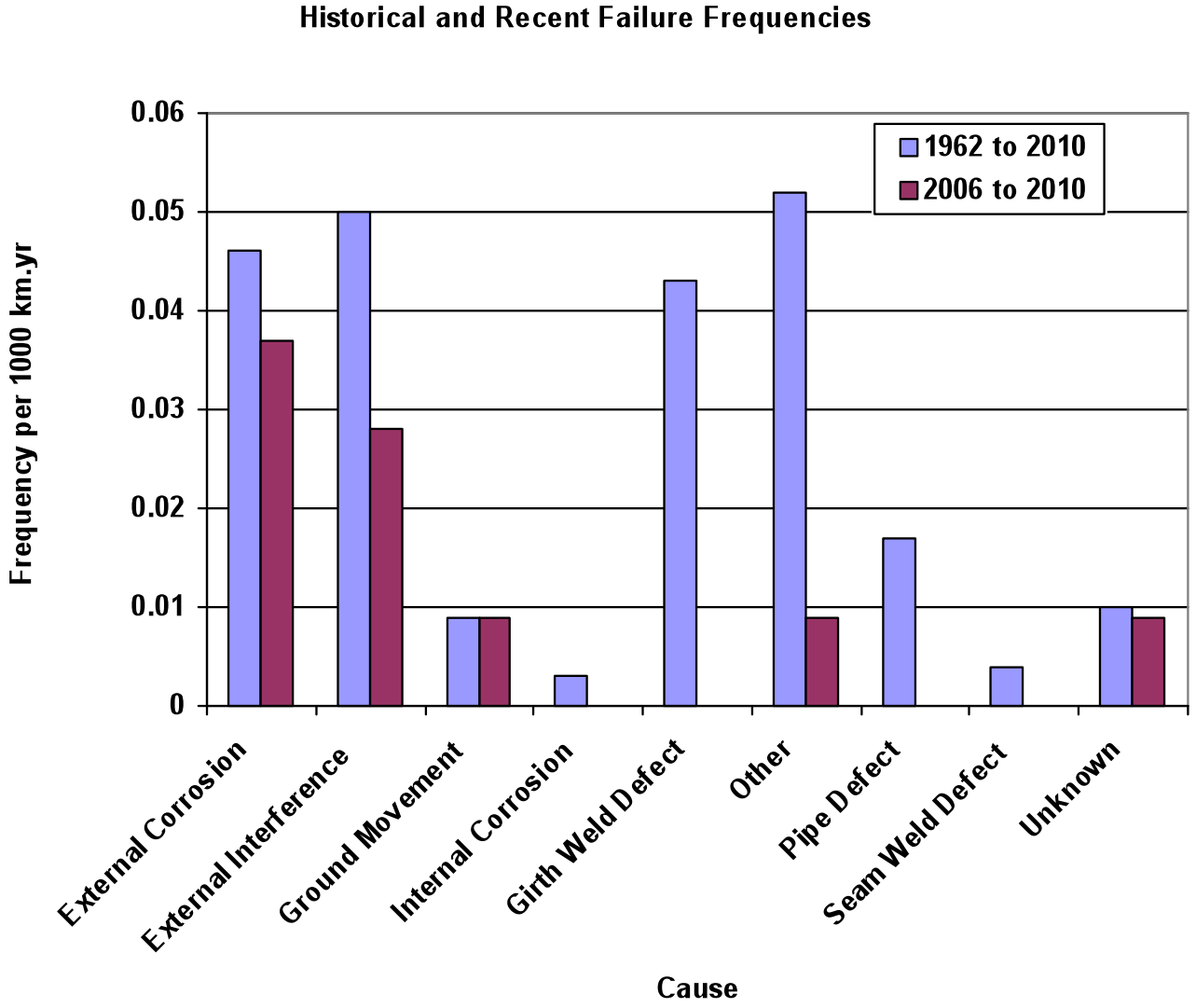
Cause = 'Other':

Other Cause	Incidents
Internal cracking due to wet town gas	30
Pipe-Fitting Welds	4
Leaking Clamps	3
Lightning	1
Soil stress	1
Threaded Joint	1
Electric Cable Arc Strike	1
Total	**41**

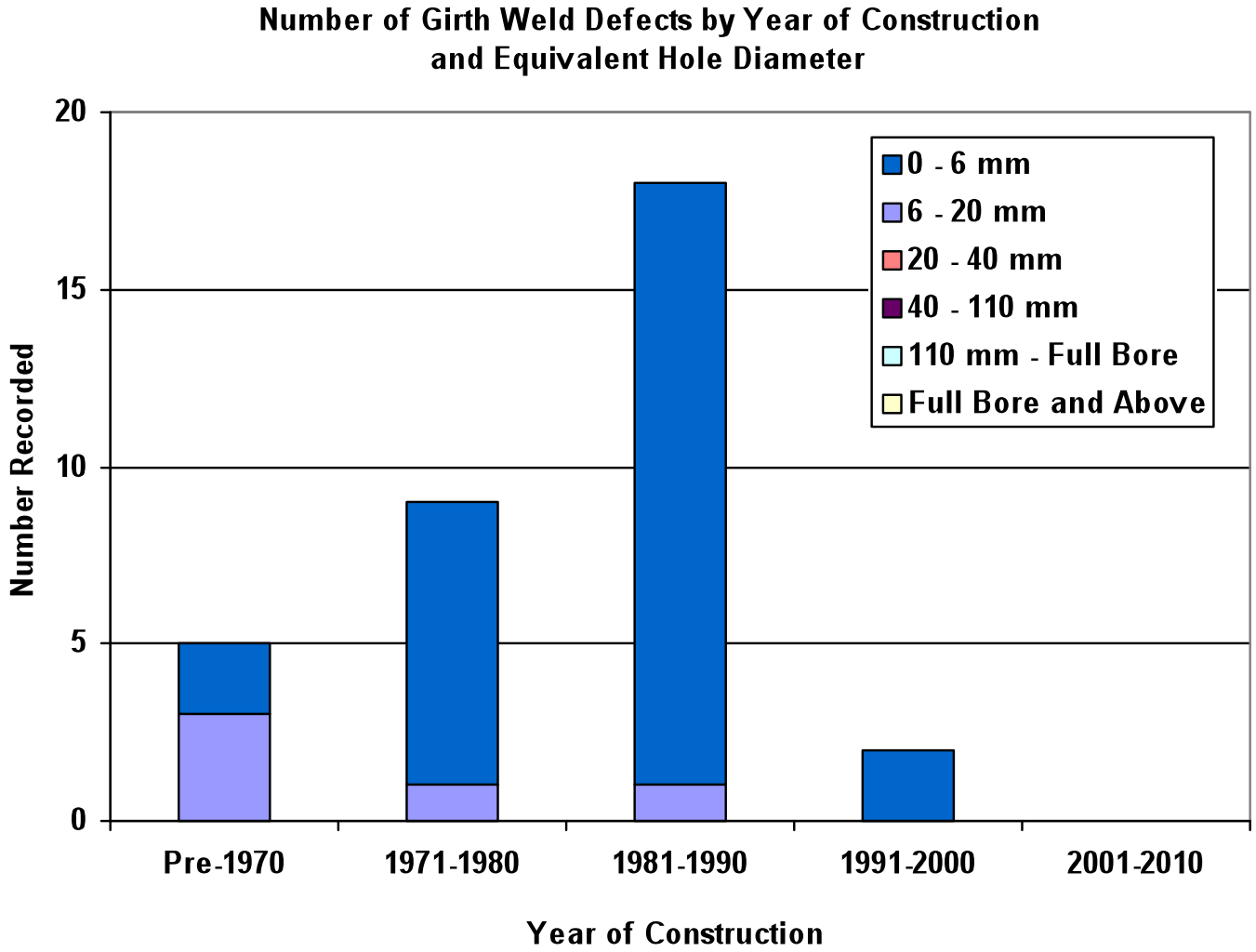
Causes - trends



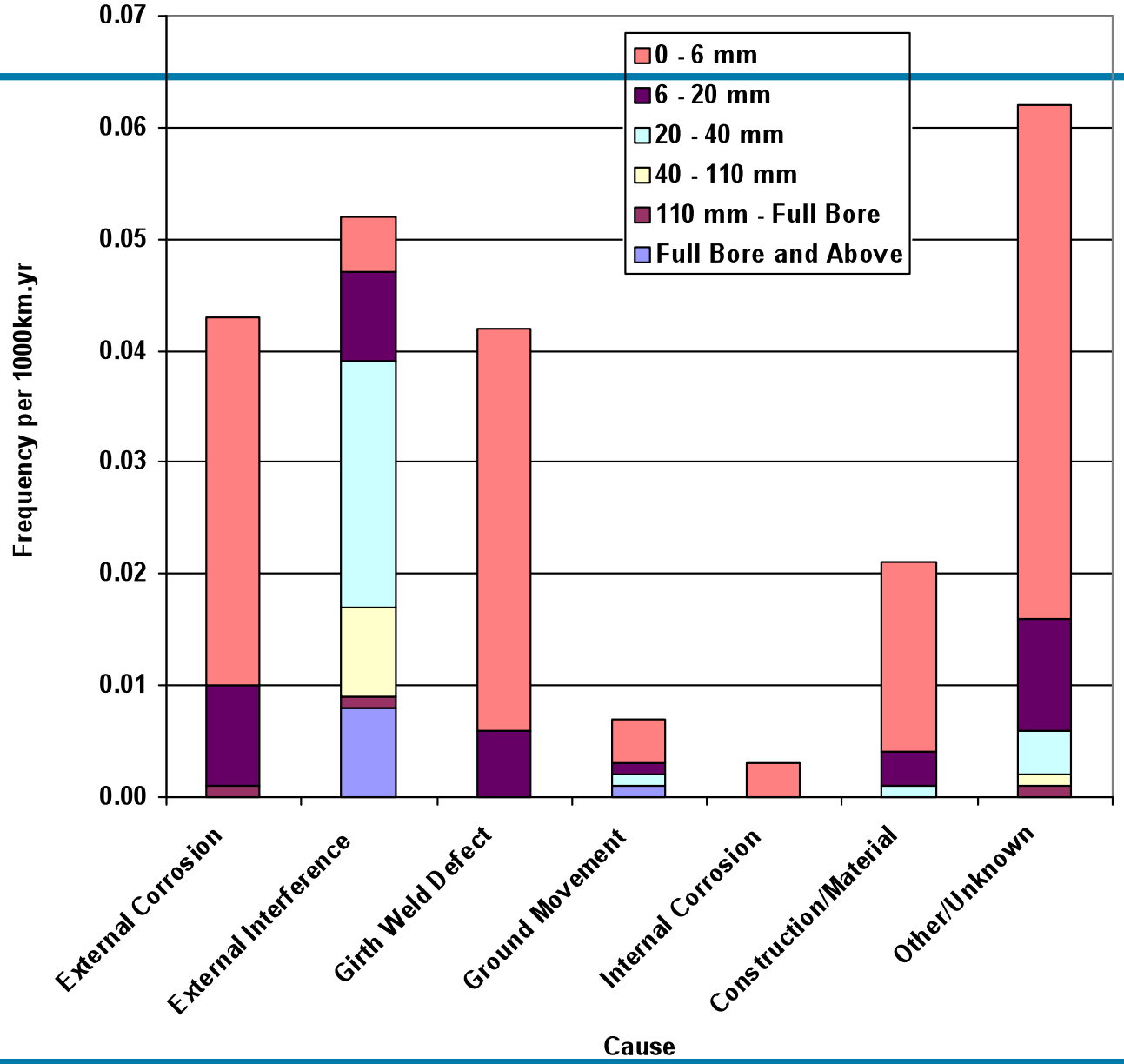
Recent Causes



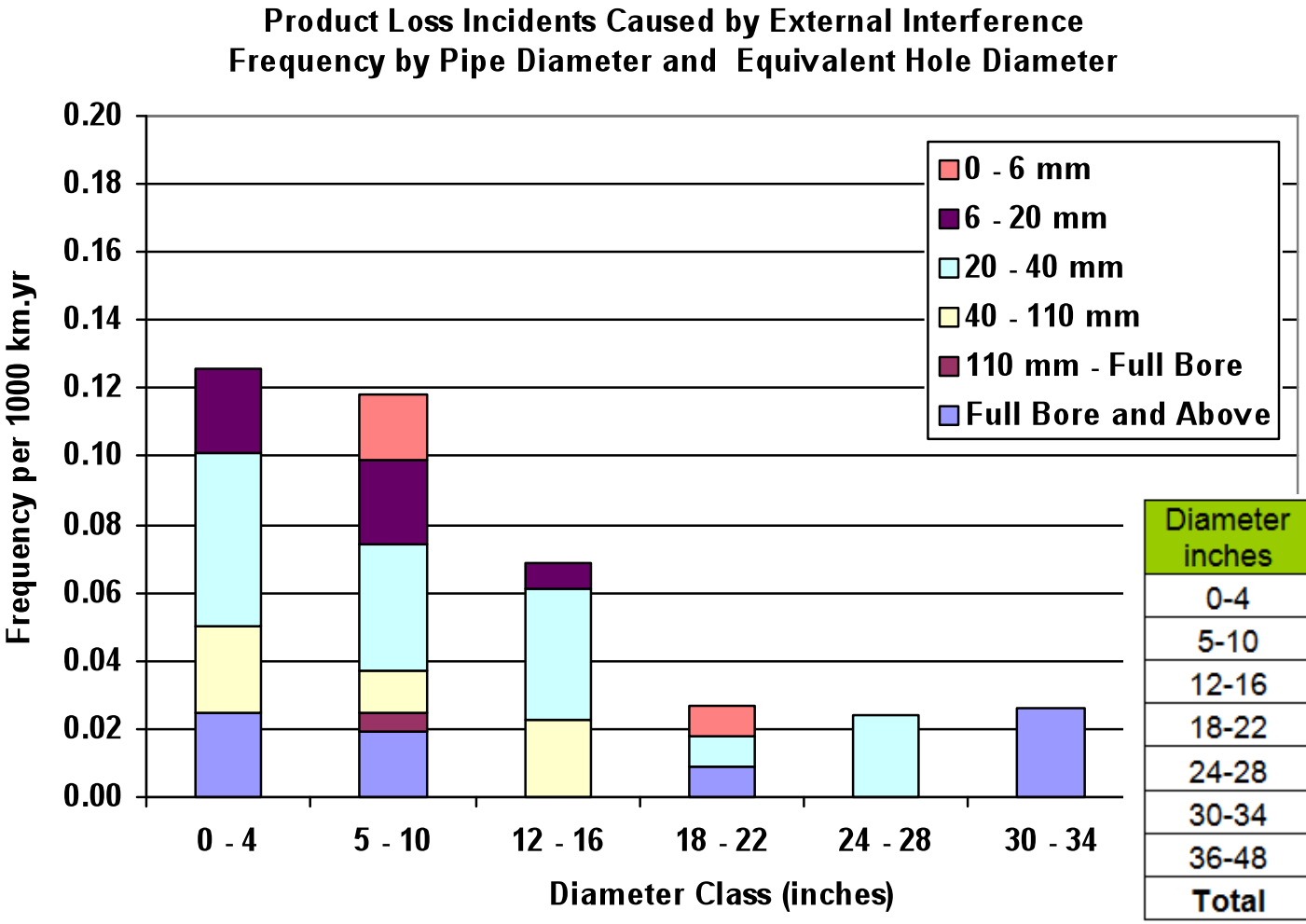
Girth Weld Defects



Product Loss Incidents by Cause and Equivalent Hole Diameter

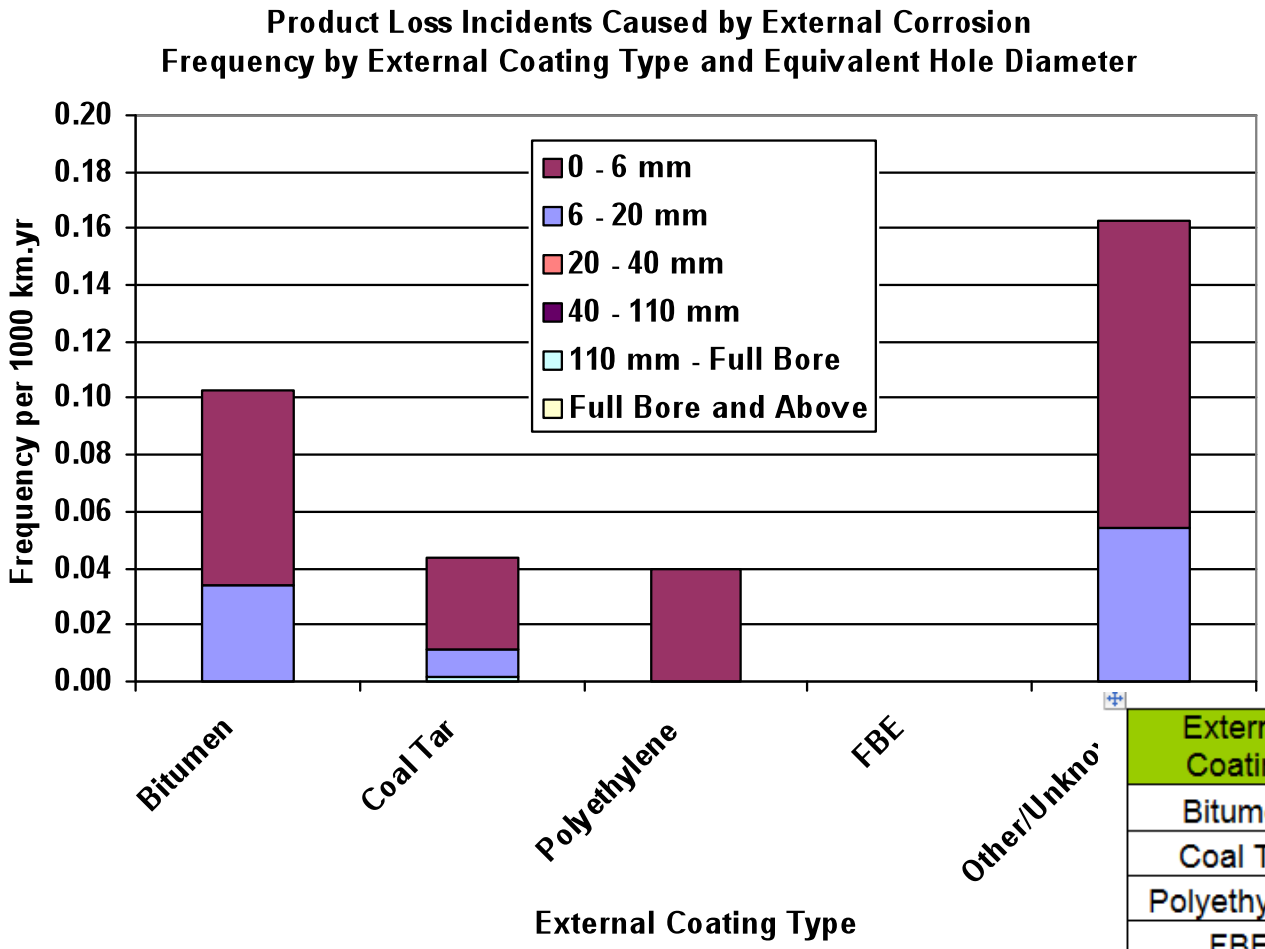


External Interference Vs Diameter



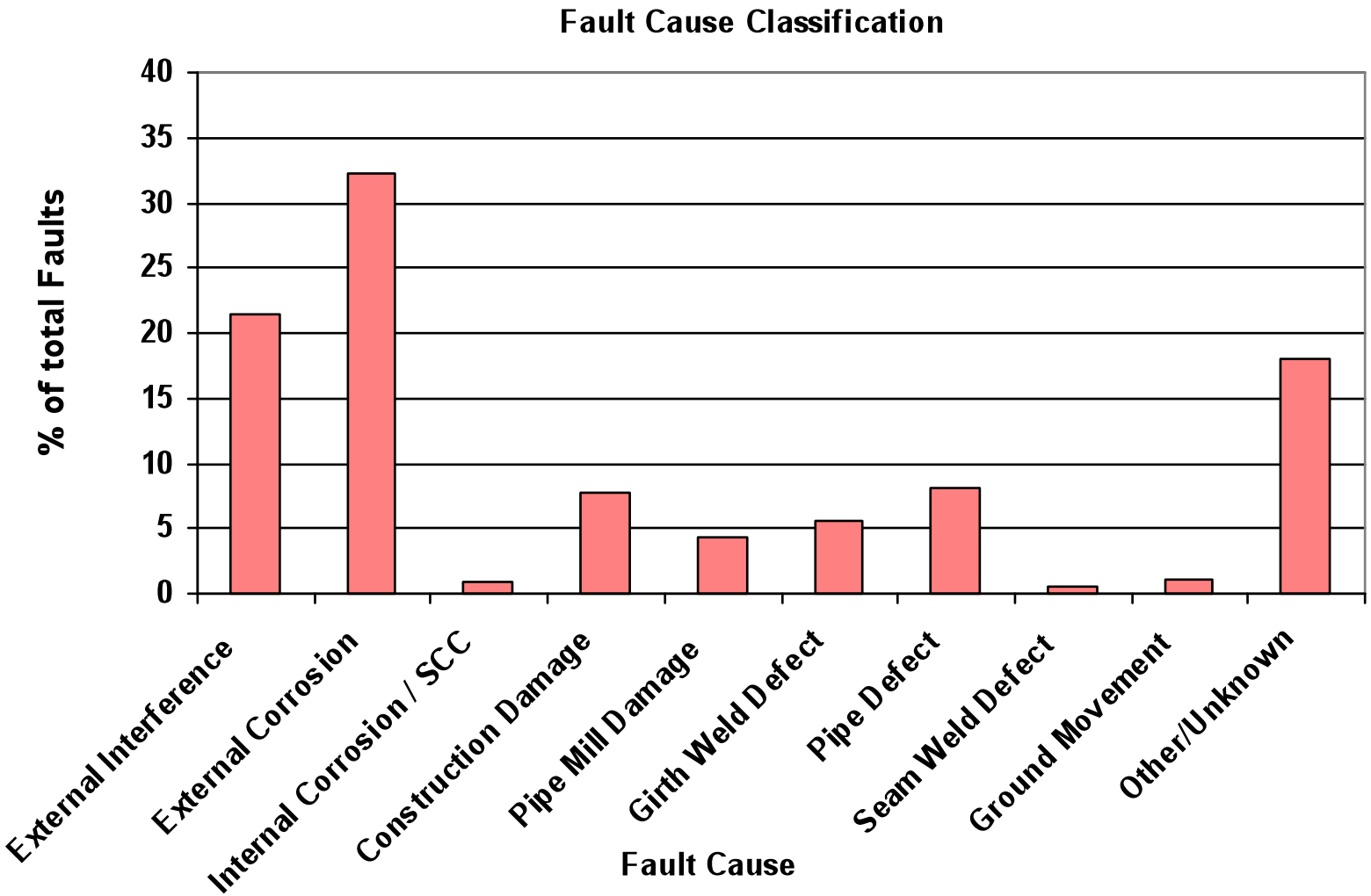
Diameter inches	Exposure km.yr	Incidents	Frequency /1000km.yr
0-4	39239	5	0.127
5-10	161610	19	0.118
12-16	131519	9	0.068
18-22	115165	3	0.026
24-28	127103	3	0.024
30-34	37942	1	0.026
36-48	172806	0	0.000
Total	**785350**	**40**	**0.051**

External Corrosion Vs Coating

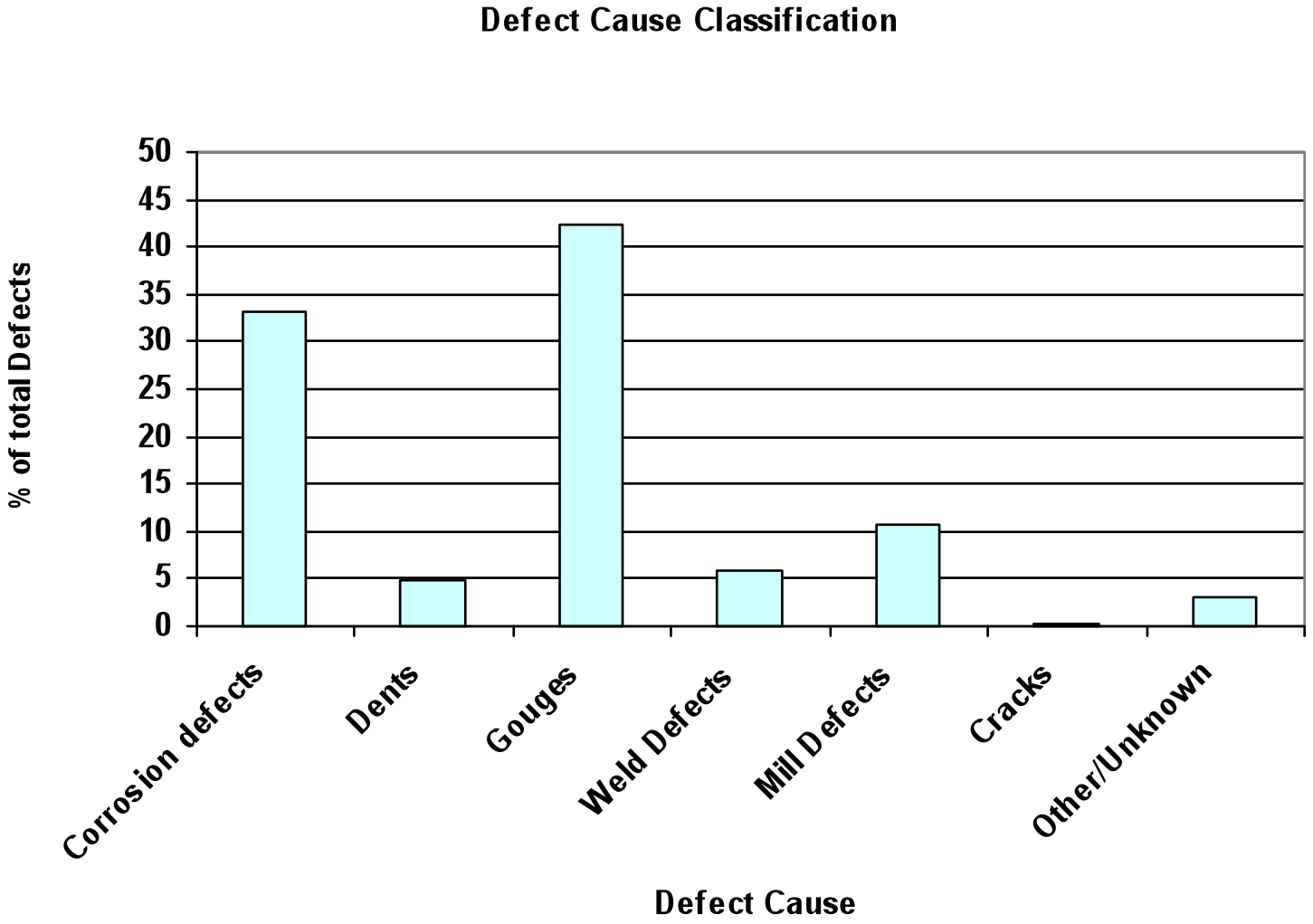


External Coating	Exposure km.yr	Incidents	Frequency /1000 km.yr
Bitumen	29090	3	0.103
Coal Tar	569393	25	0.044
Polyethylene	75292	3	0.047
FBE	74829	0	0.000
Other/Unknown	36780	6	0.163
Total	**785385**	**37**	**0.047**

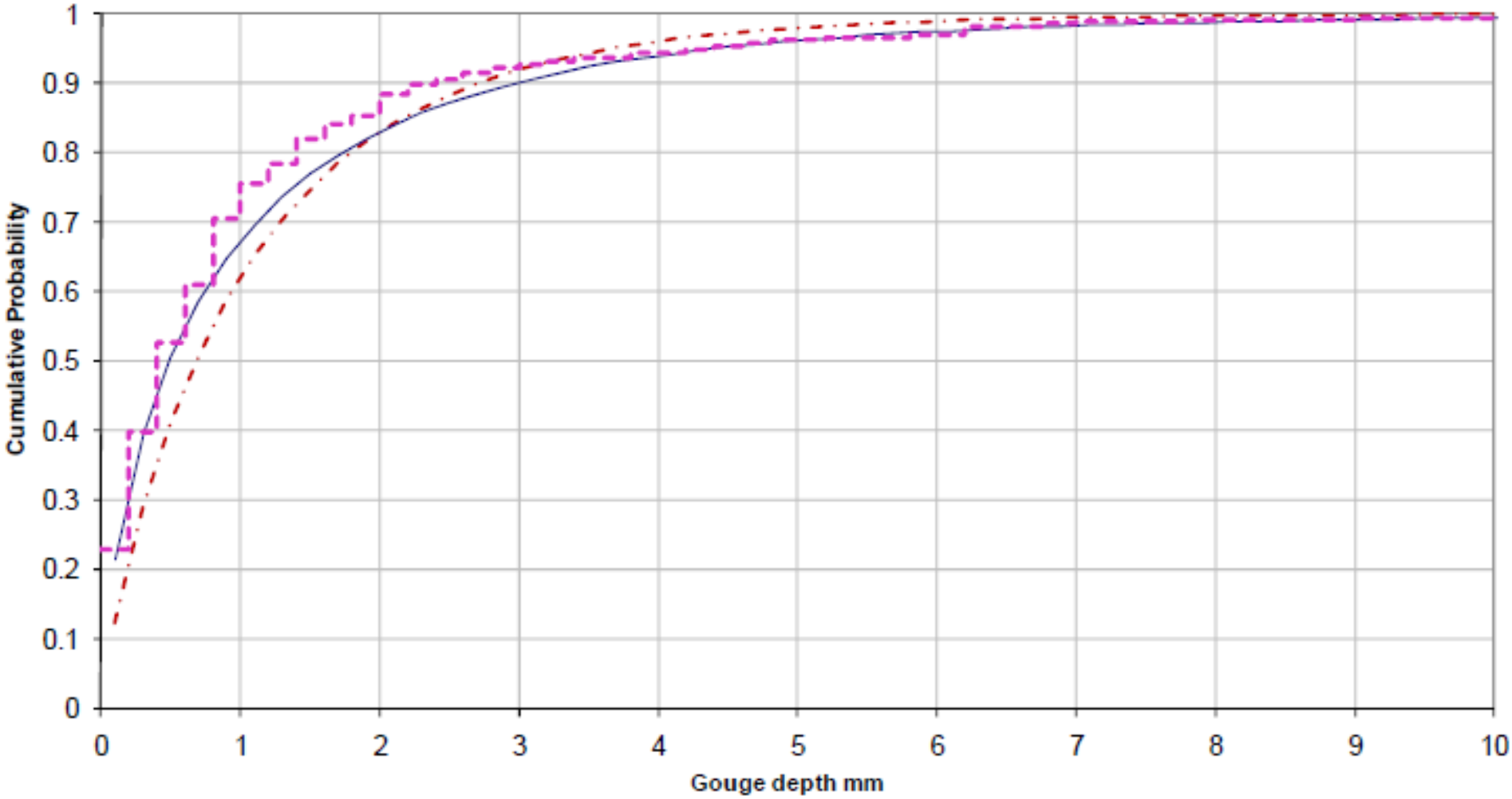
3080 Fault in Database



5087 Defects in Database



Weibull Damage Data Distributions



Susannah Turner, Penspen Integrity Ltd, Units 7-8, Terrace Level , St. Peters Wharf, Newcastle upon Tyne Tyne and Wear NE6 1TZ England, UK