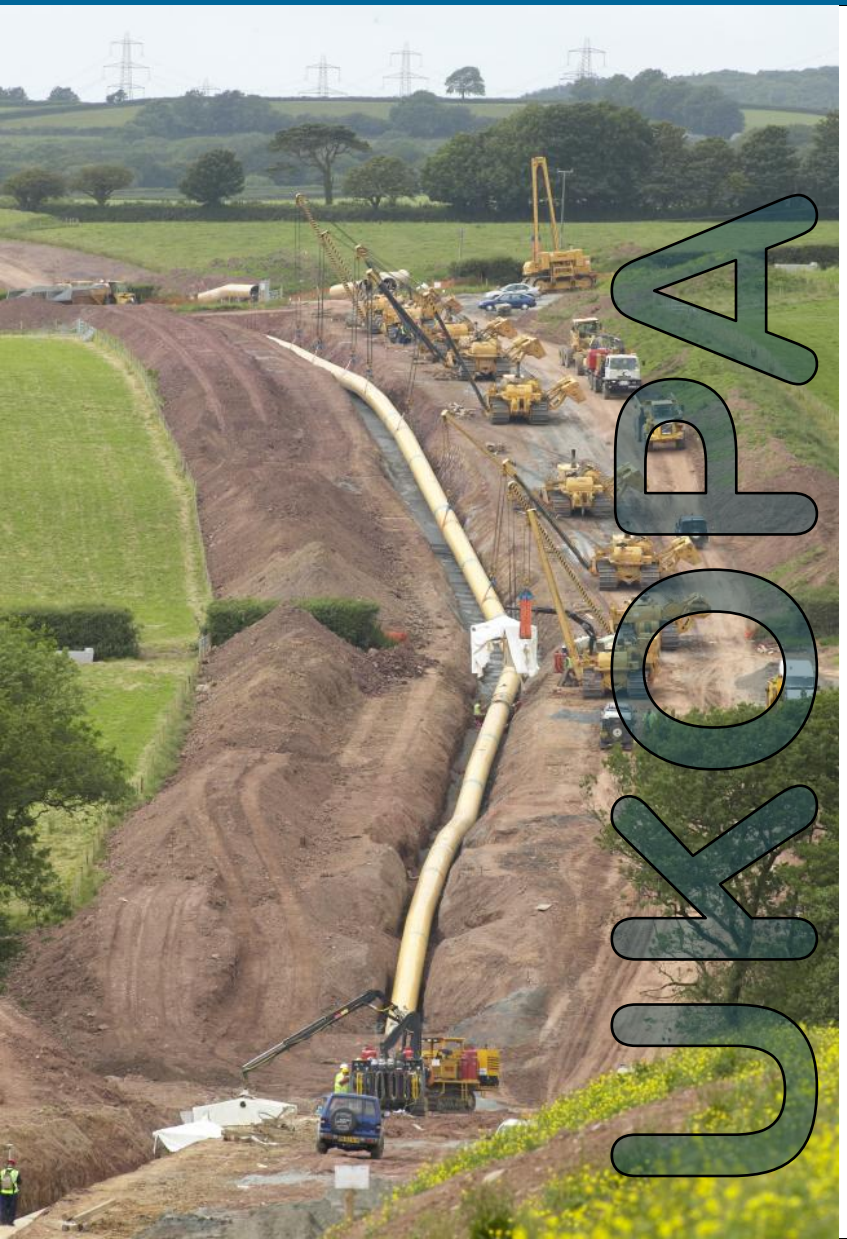


UKOPA MAHP Product Loss & Fault Report

Graham Goodfellow – FARWG

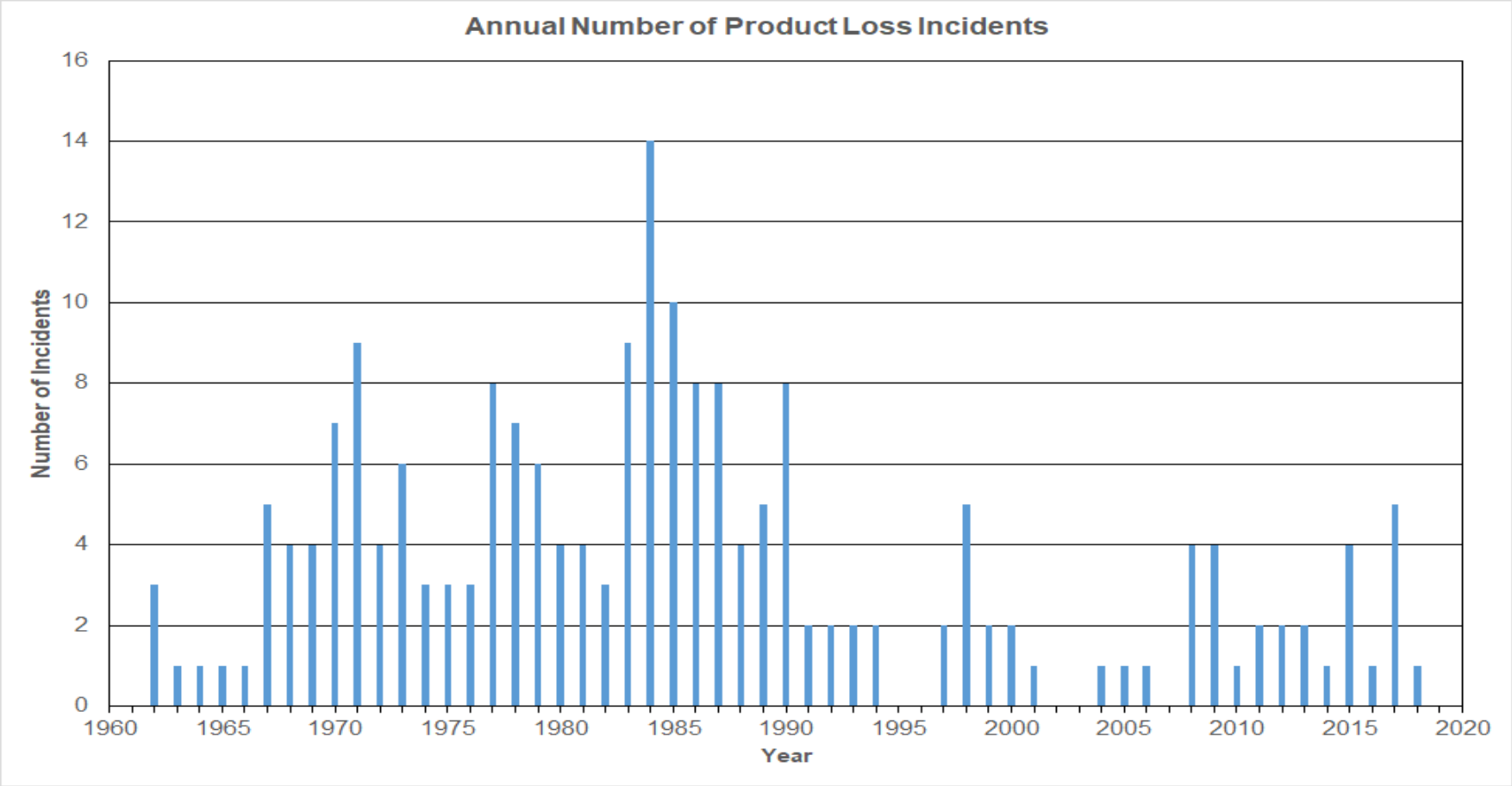
Principal Consultant - PIE

2018 Product Loss & Fault Data

- 1 product loss incident!
  - 1 leak due to combination of external interference and external corrosion
- 62 faults reported in 2018
  - Associated with 92 individual defects
    - 37 faults recorded in 2017
    - 116 faults recorded in 2016
- UKOPA Pipeline Product Loss Incidents and Faults Report (1962 – 2018)
  - v0.1 Circulated to FARWG & Board for comment
    - Comments received from Fridolin Jenny, Mike Acton & Peter Davis
  - v1.0 with Governance Group

Product Loss Incident Data

- 203 Incidents (1962 – 2018)



Product Loss Incident Data

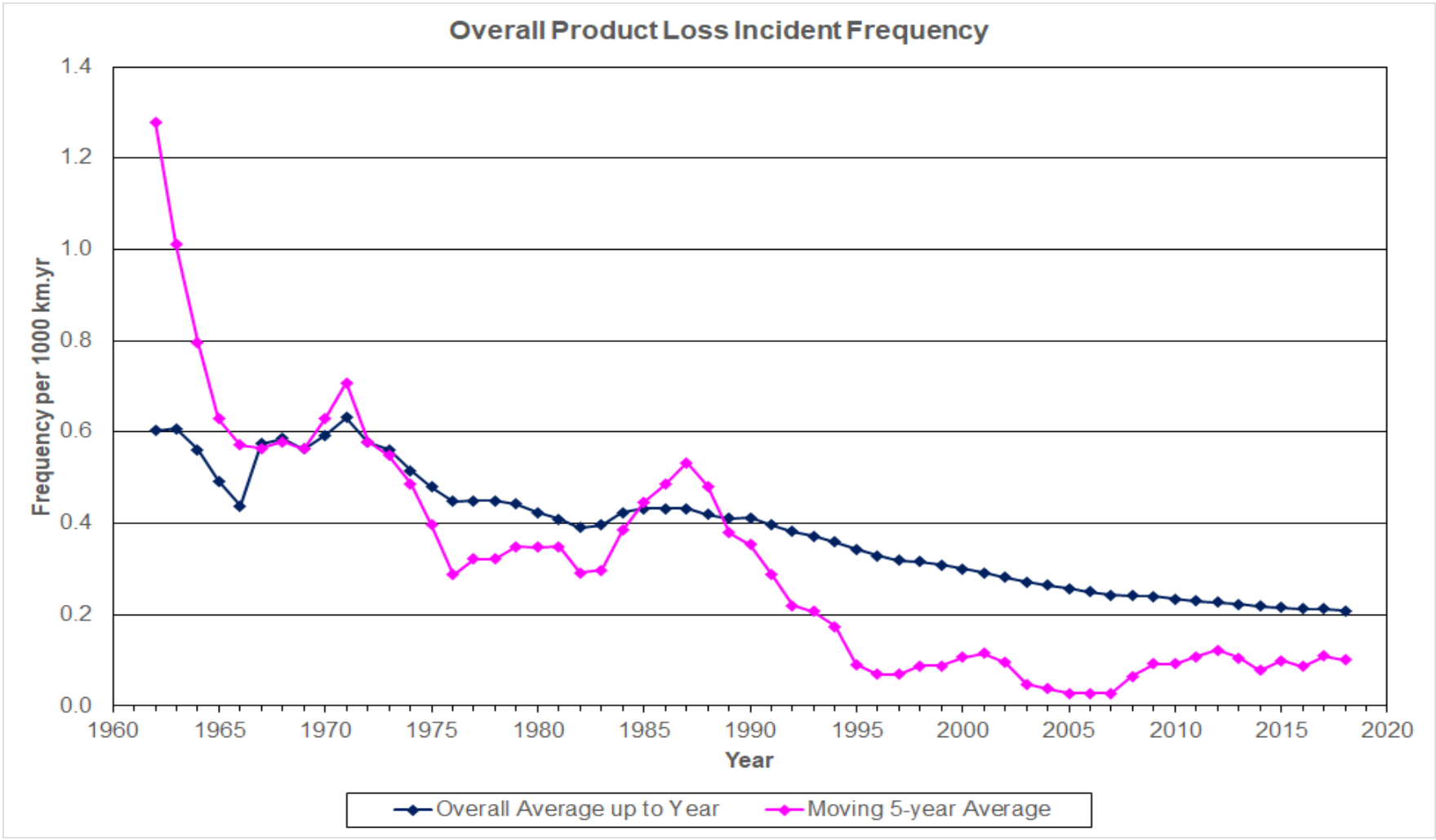
- 2018 MAHP Pipeline Population – 23,674 km
  - 92.5% natural gas

- Total Operational exposure – 974,923 km yrs
  - Includes 3,740 km yr between 1952 and 1961

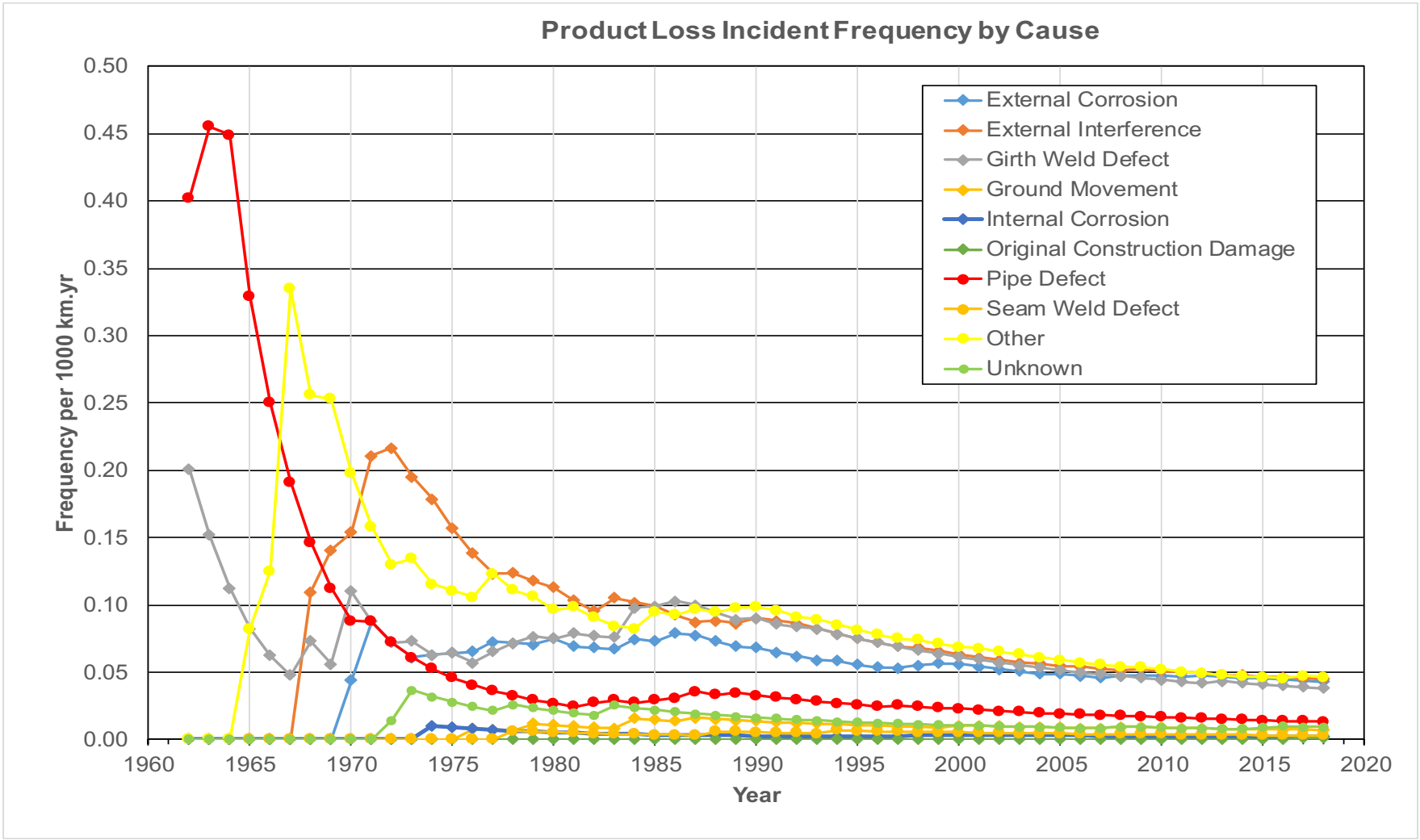
- Overall leak rate (1962 – 2018) = 0.208×10^{-3} per km yr
- 20 year leak rate (1998 – 2017) = 0.078×10^{-3} per km yr
- 5 year leak rate (2014 – 2018) = 0.100×10^{-3} per km yr

- *2017 leak rate* = *0.042×10^{-3} per km yr*

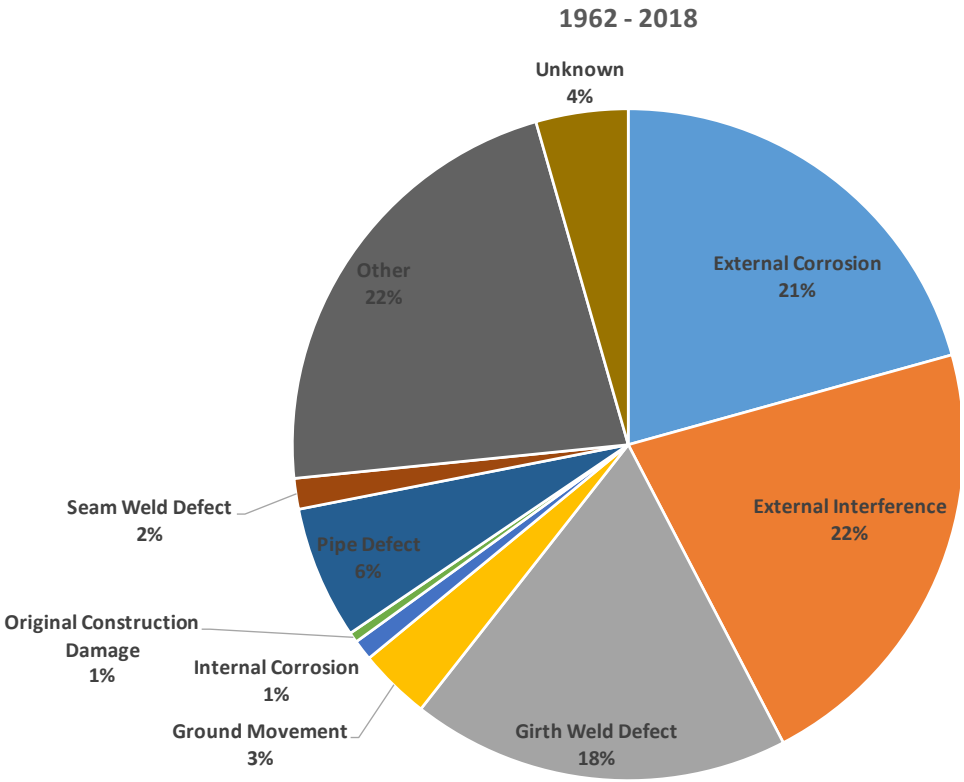
Overall Product Loss Incident Frequency

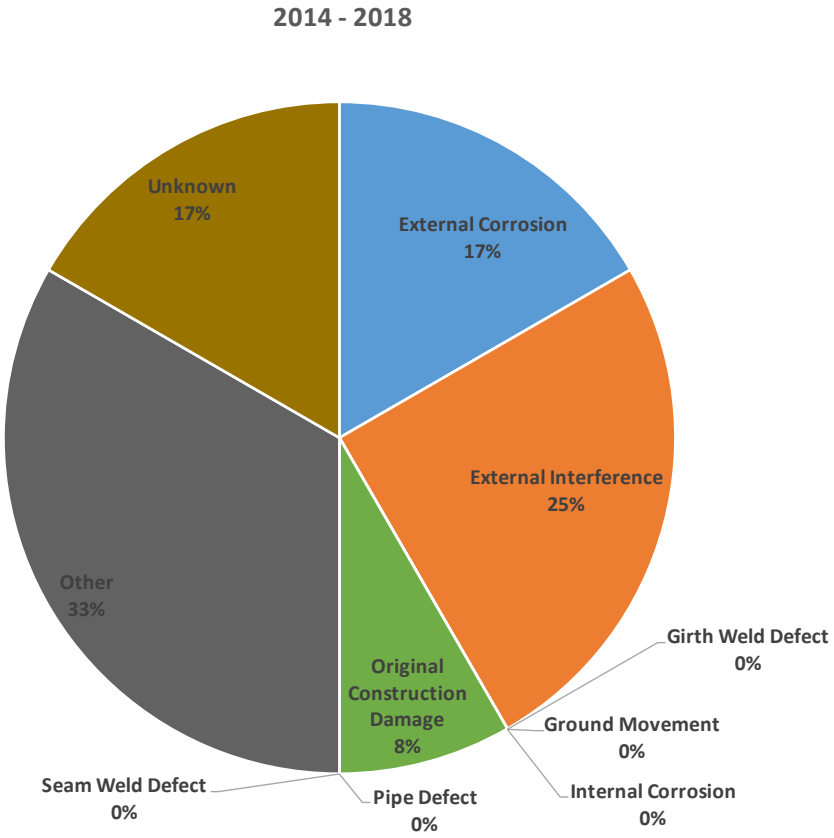


Product Loss Incident Frequency by Cause



Product Loss Incident Frequency by Cause

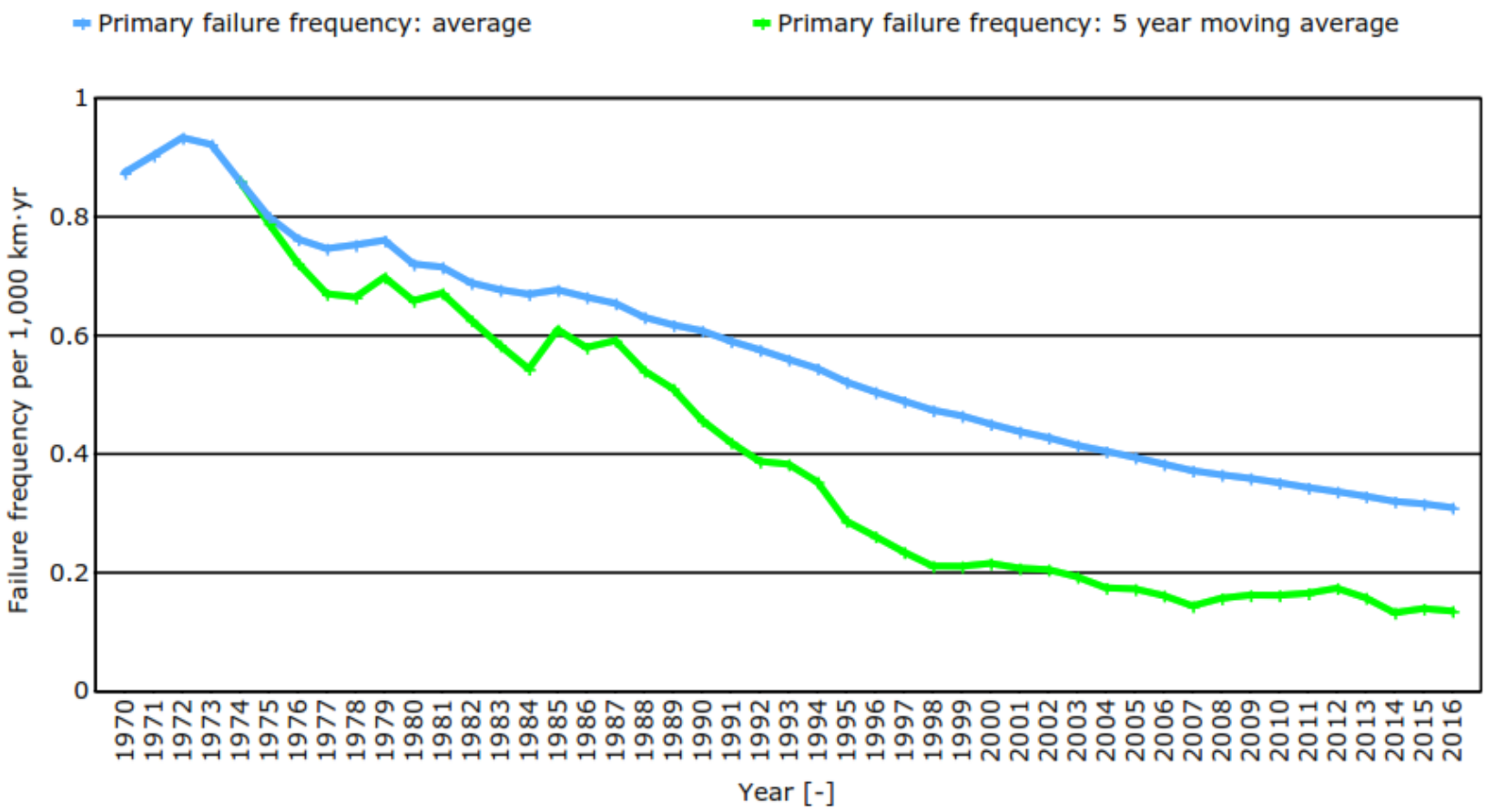




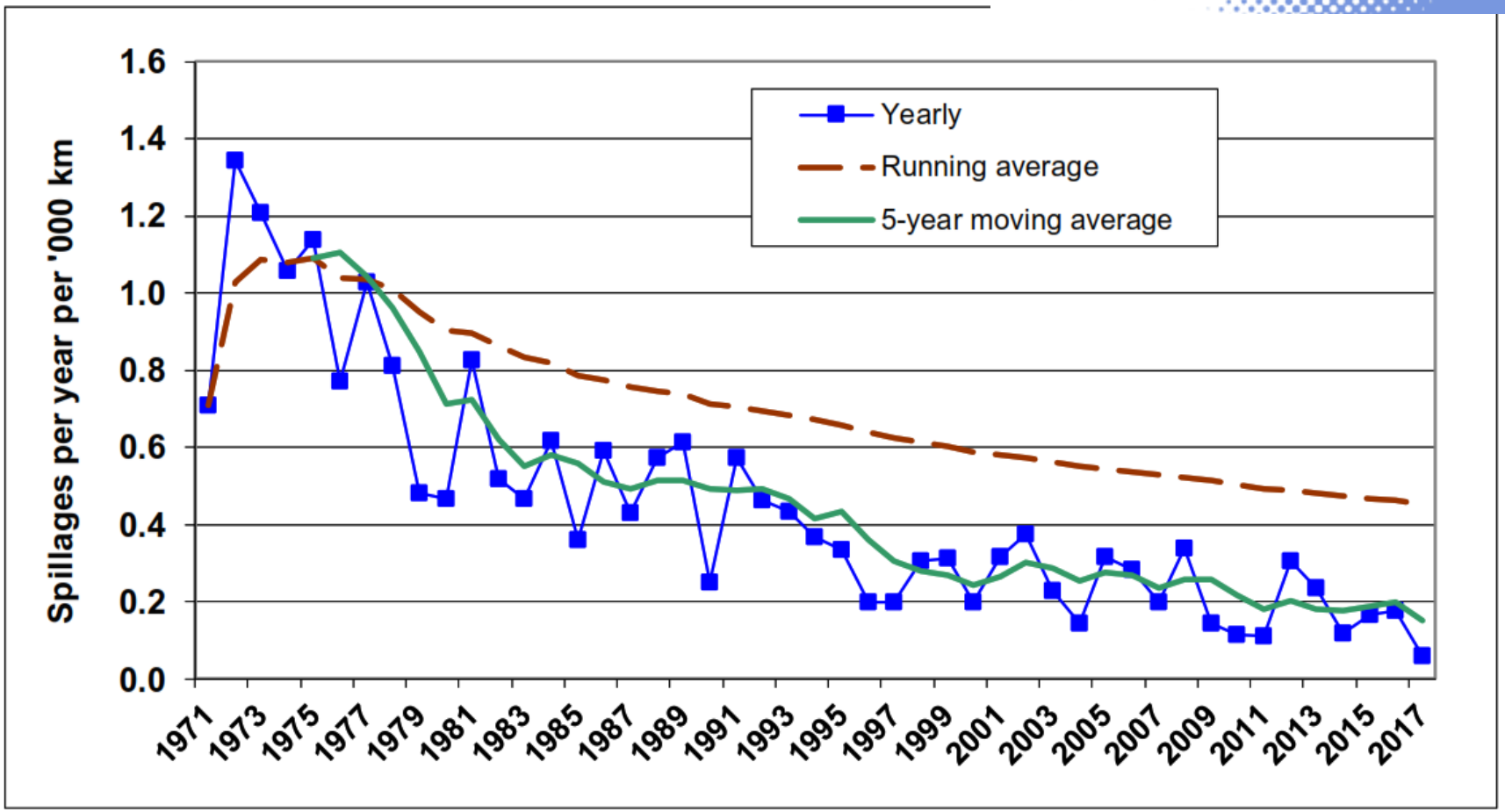
Comparison with Europe – Product Loss Databases

Parameter	UKOPA	EGIG	CONCAWE
Length (km)	23,674	142,794	35,312
From	1962*	1970	1971
Exposure (million kmyrs)	0.97	4.41	
No. of Product Loss Incidents	203	1,366	754 / 496
Fluids	Natural Gas Ethylene / LPG / Propane / Ethane / Spiked Crude	Natural Gas	Crude Oil & Oil Products
Minimum Release (m^3)	0	0	1
No. of Active Members	14	17	62

EGIG – Overall Product Loss Frequency

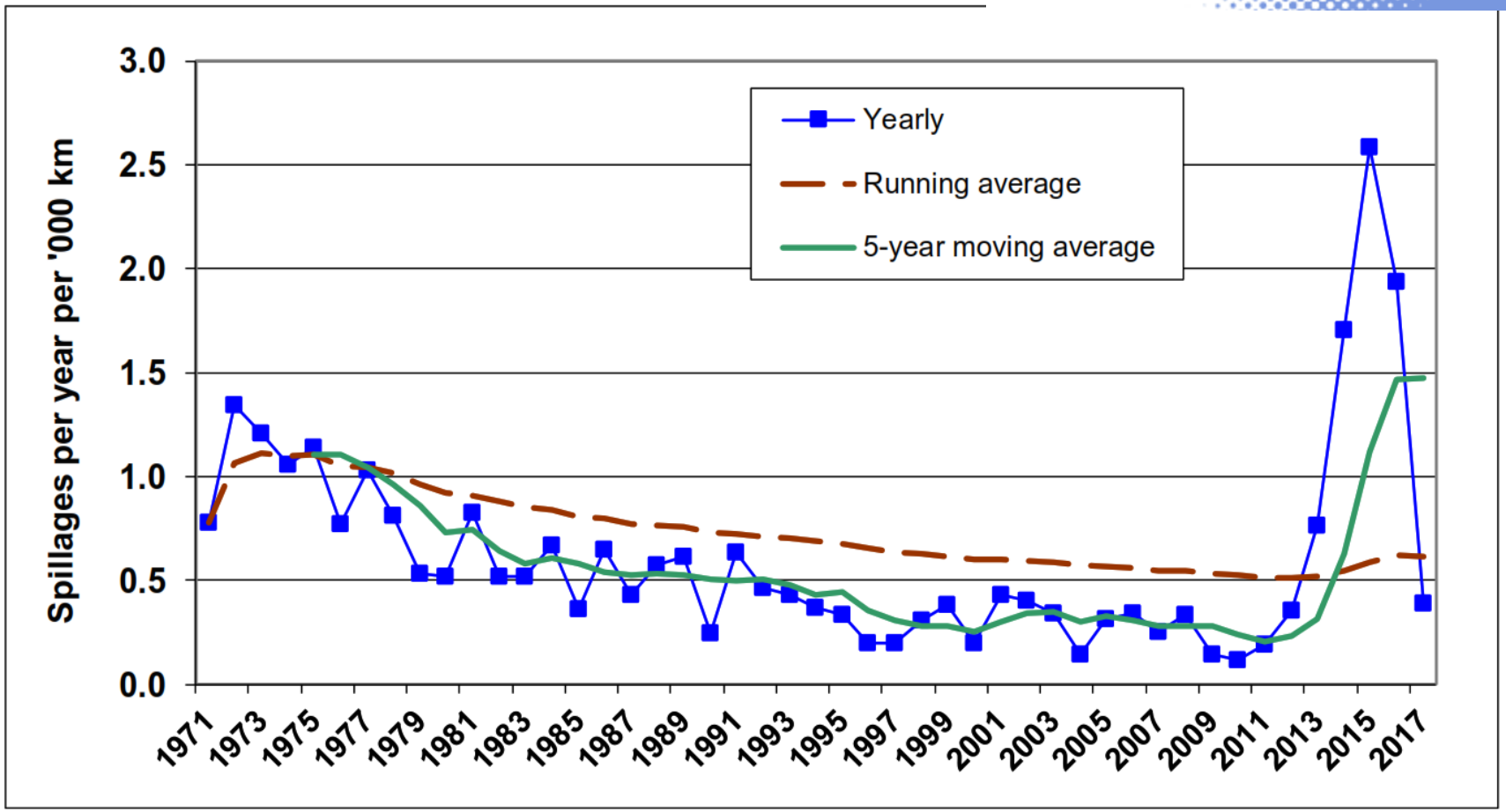


CONCAWE – Overall Product Loss Frequency



Excluding Theft

CONCAWE – Overall Product Loss Frequency



Including Theft

Comparison with Europe – Overall Product Loss Frequency

Source	Period	No. of Incidents	Total Exposure	Failure Frequency (per 1000 km yrs)
UKOPA	1962 – 2018	203	0.97	0.21
	2014 - 2018	12	0.12	0.10
EGIG	1970 – 2016	1366	4.41	0.31
	2012 – 2016	97	0.72	0.15
CONCAWE	1971 – 2017	754 / 496	*1.06*	*0.71 / 0.47*
	2013 – 2017	256 / 26	0.18	1.48 / 0.15

Round Table Discussion

- Have you seen the Product Loss report before?
  - Have you read it?
- What do you think of the information within it?
- How could it be improved?
- Could we use the data in a different way?
- Is there anything else you'd like to see in it?