

35-years of Pipeline Incidents Statistics Lessons learned

**Jean-François Larivé
Technical Coordinator, CONCAWE**

What is CONCAWE?

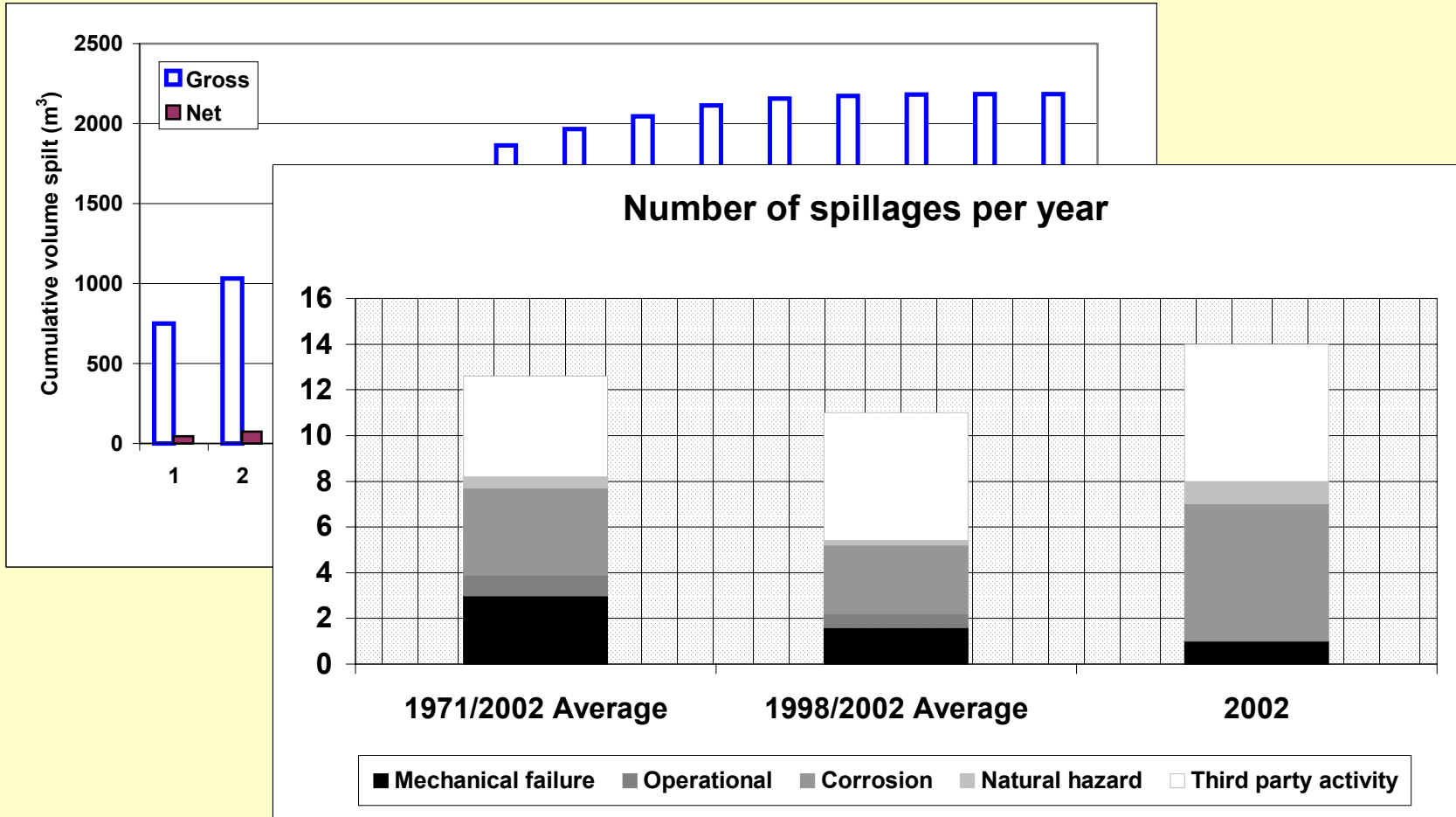
CONservation of Clean Air and Water in Europe

- Association of the European downstream oil industry
 - Started in 1963
 - All major players, about 80% of total EU refining capacity
- Field of interest
 - started with refinery emissions to air and water
 - Gradually extended to all aspects of HSSE relevant to the industry
- Currently
 - Fuels quality and vehicle emissions
 - Air quality
 - Health
 - Petroleum products
 - Safety
 - **Cross country oil PIPELINES**

The Oil Pipelines Group

- A forum for EU pipeline operators to exchange information e.g. on operational, environmental and safety matters
- Started in the early 70s
- Membership include all major land based oil pipeline operators in the EU (both crude oil and products)
- Activities
 - Monitoring of EU legislation developments on pipelines
 - Follow-up development of related standards (ISO and CEN)
 - Exchange of information on
 - ◆ Best practices
 - ◆ Incidents and lessons learned
 - Organisation of an Information Exchange Symposium every 4 years
 - Over 30-years of information and statistics on spillage incidents

Yearly report giving details of incidents, causes and remediation, historical perspective



Information on incident prevention techniques and systems (e.g. intelligence pigging)

Table 4.1 Length (km) of pipeline inspected using intelligence pigs

Inspection year	Metal Loss Pig	Crack Detection Pig	Geometry Pig	Total Pipeline Inventory
2002	2925	902	2643	34,596
2001	2453	997	1341	35,575
5-year Average	3395	596	2393	32,398

Up-to-date map of EU land-based oil pipelines

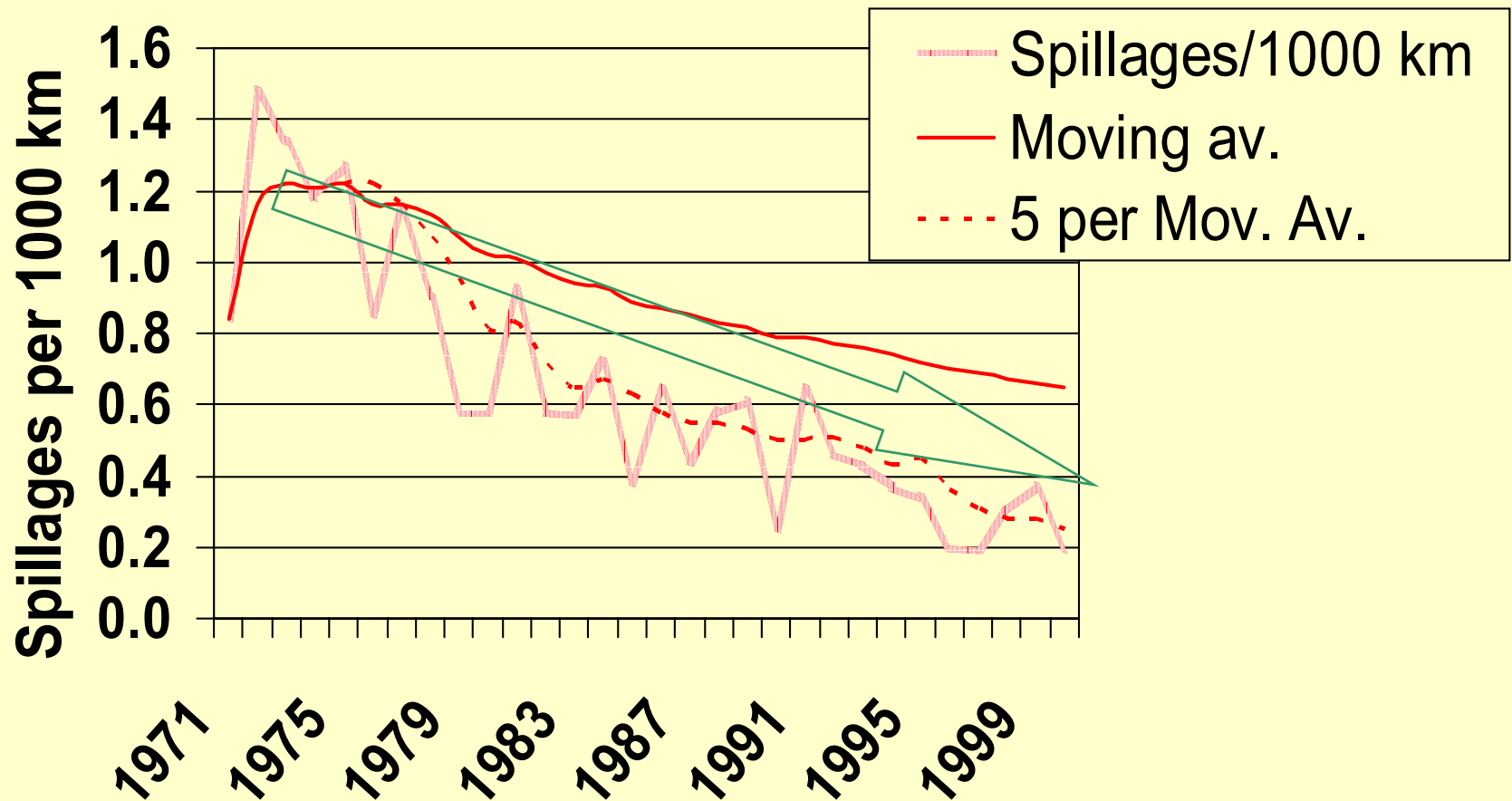


- There are over 250 crude oil and products pipelines in Europe
 - Together they form a network of over 35,000 km
 - $\frac{3}{4}$ are product pipelines
- Crude lines are on average larger than product lines
 - 50% of crude lines are 24" or more
 - 60% of product lines are 16" or less
- In 2003 they transported 817 million m³ of hydrocarbons
 - This number is somewhat higher than the consumption of oil products in Europe

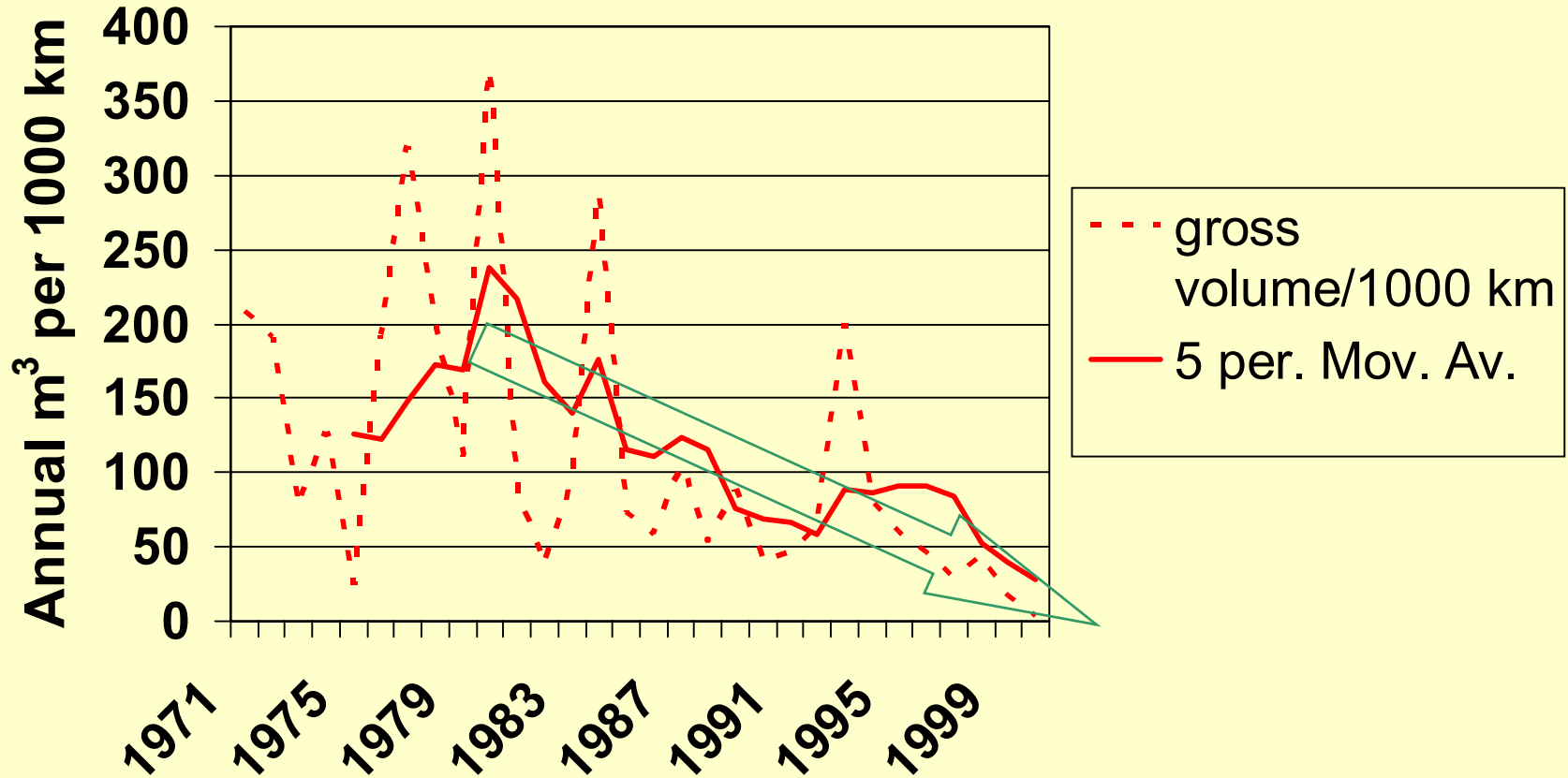


Spillage statistics 1971-2000

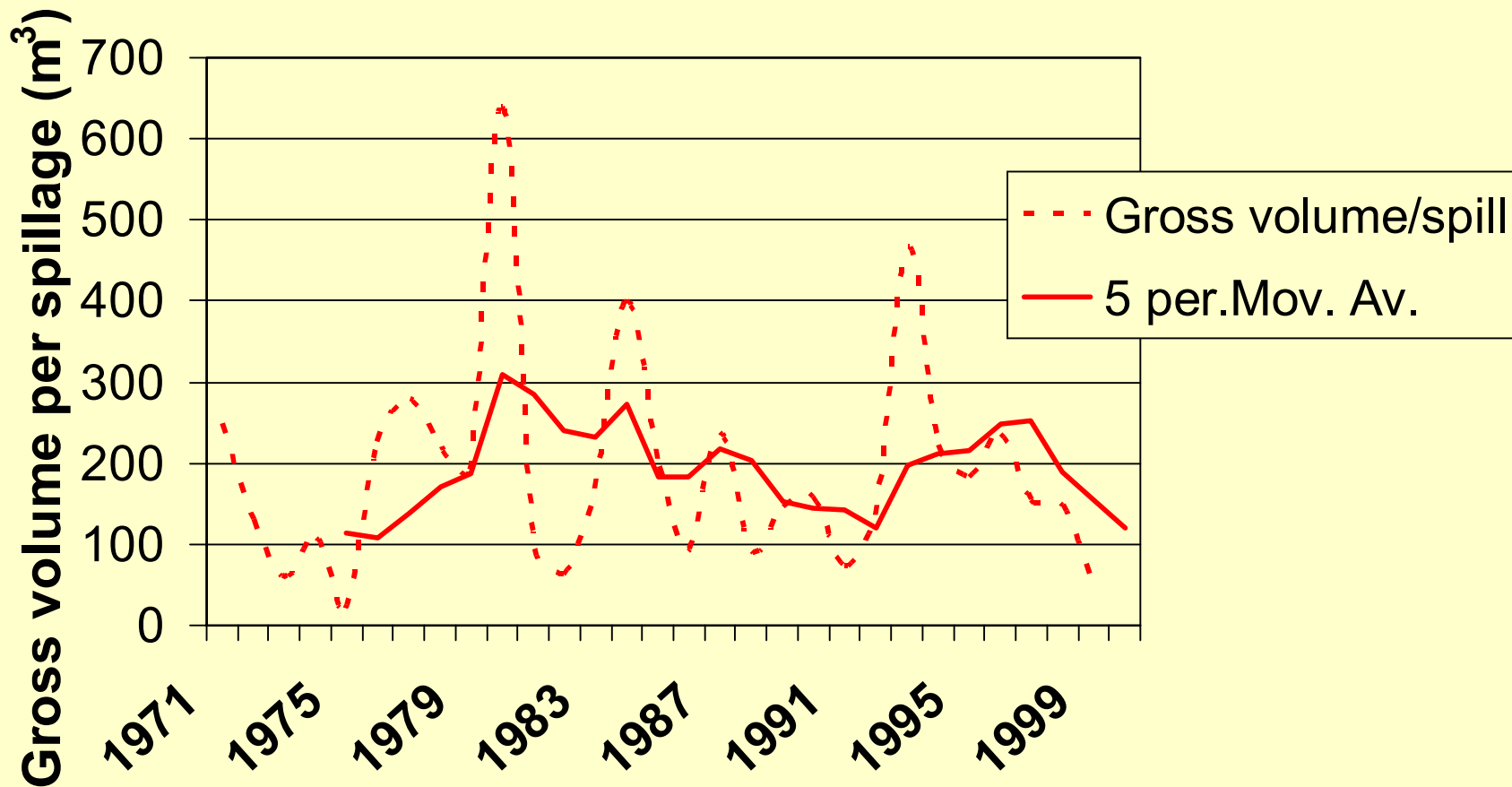
The number of spills per 1000 km has shown a downward trend over the years...



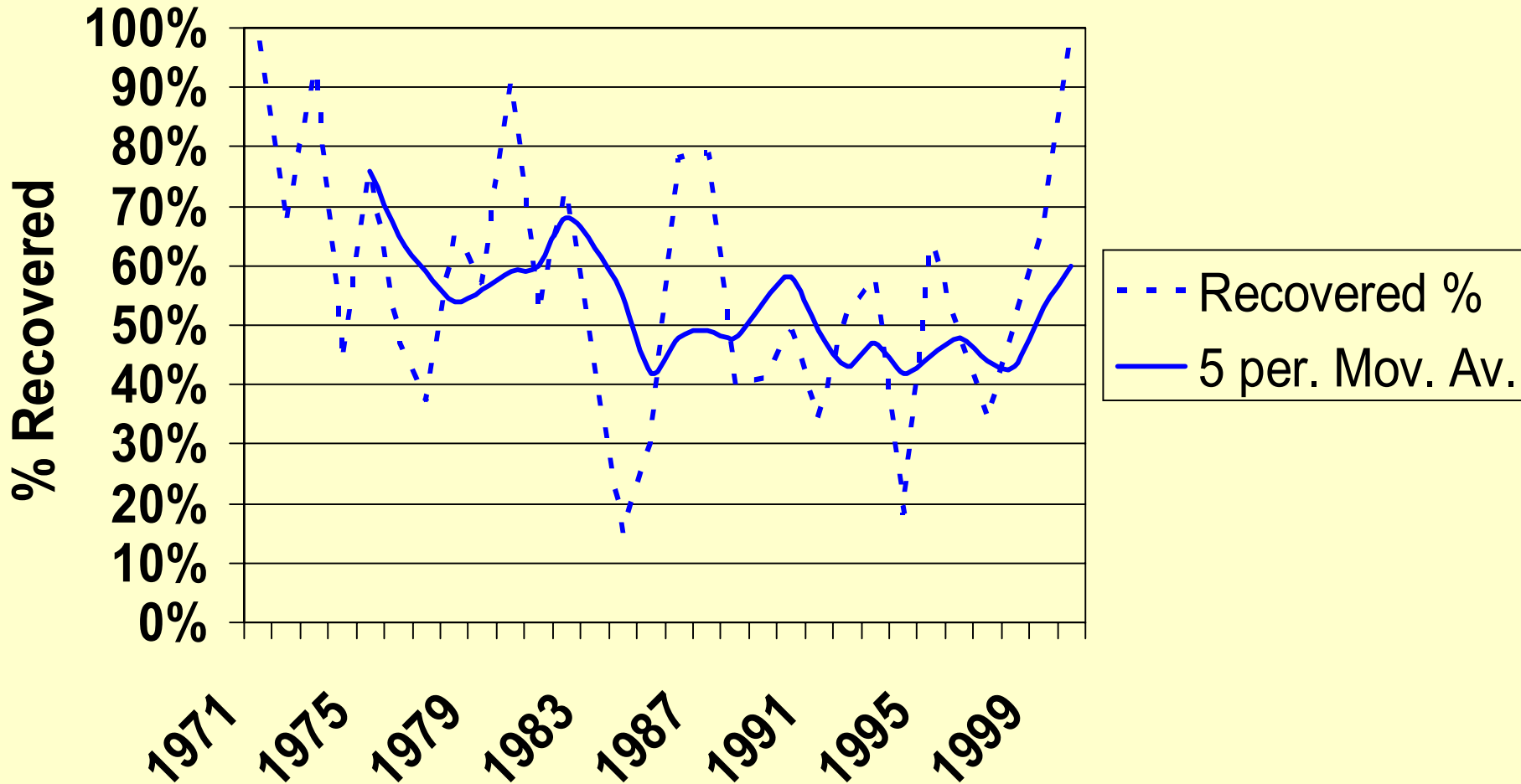
...And so has the annual gross volume spilled per 1000 km



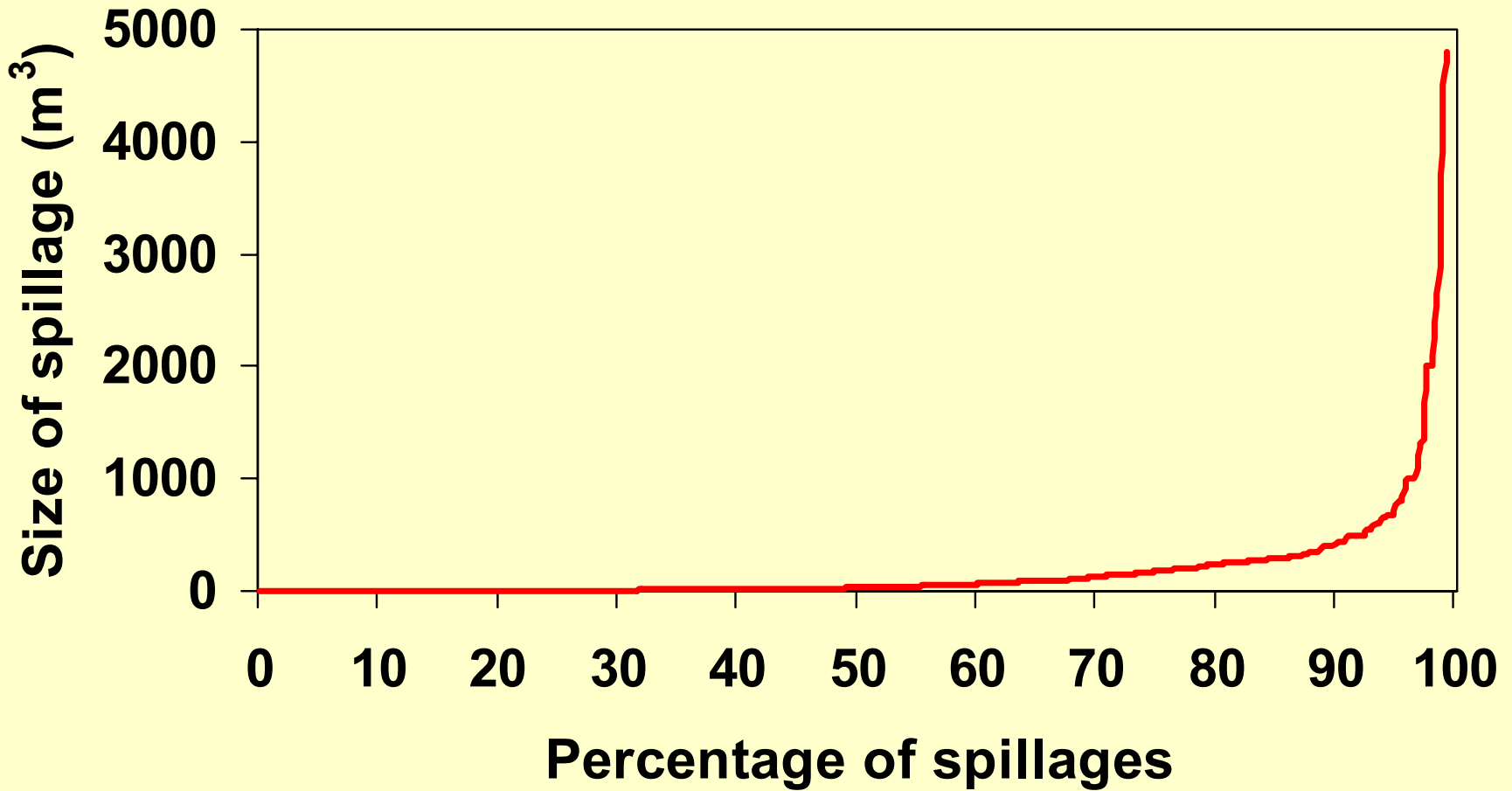
The severity of spills has remained broadly constant



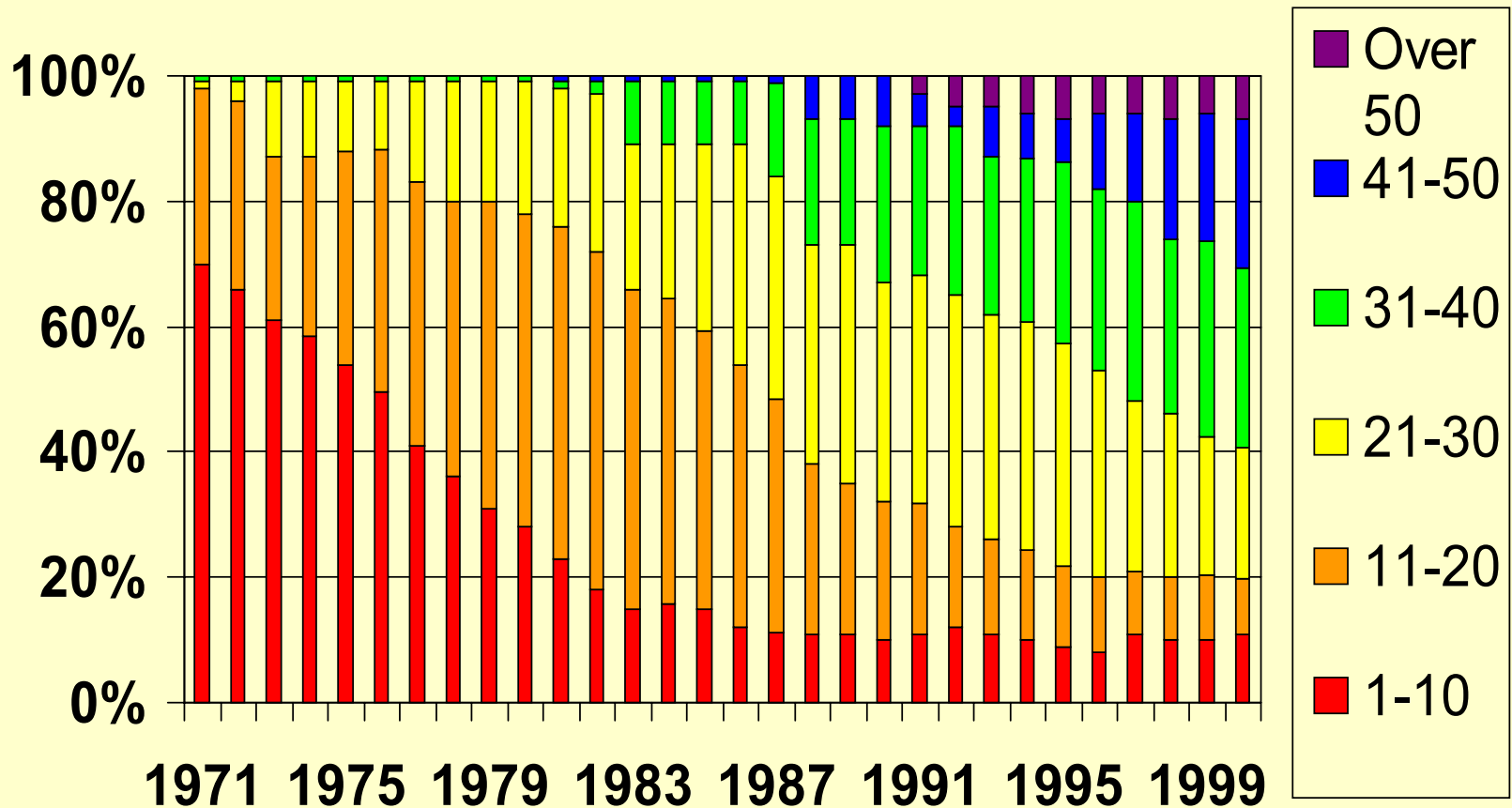
About 50% of the spilled oil is recovered



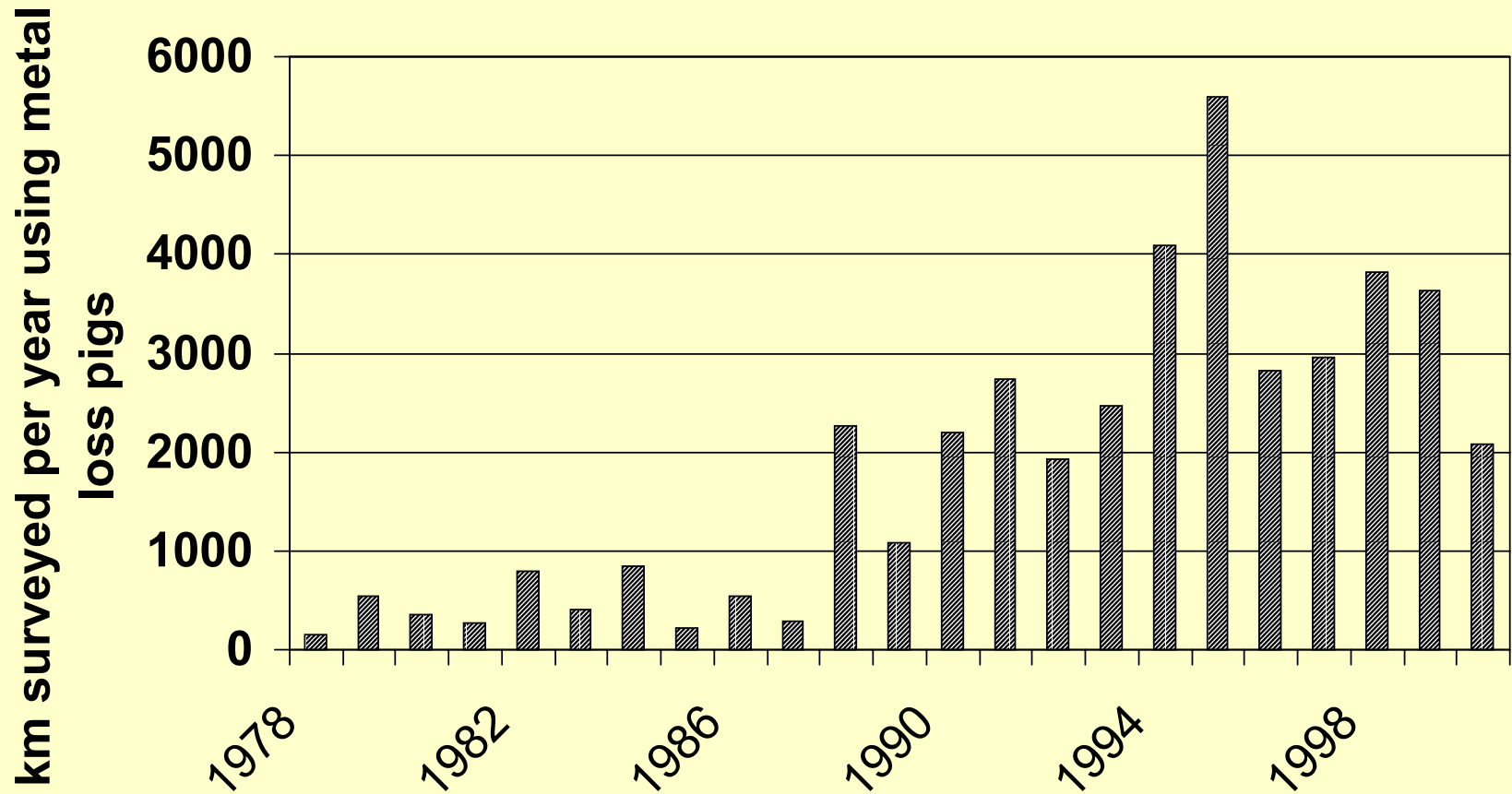
Distribution of gross spill sizes



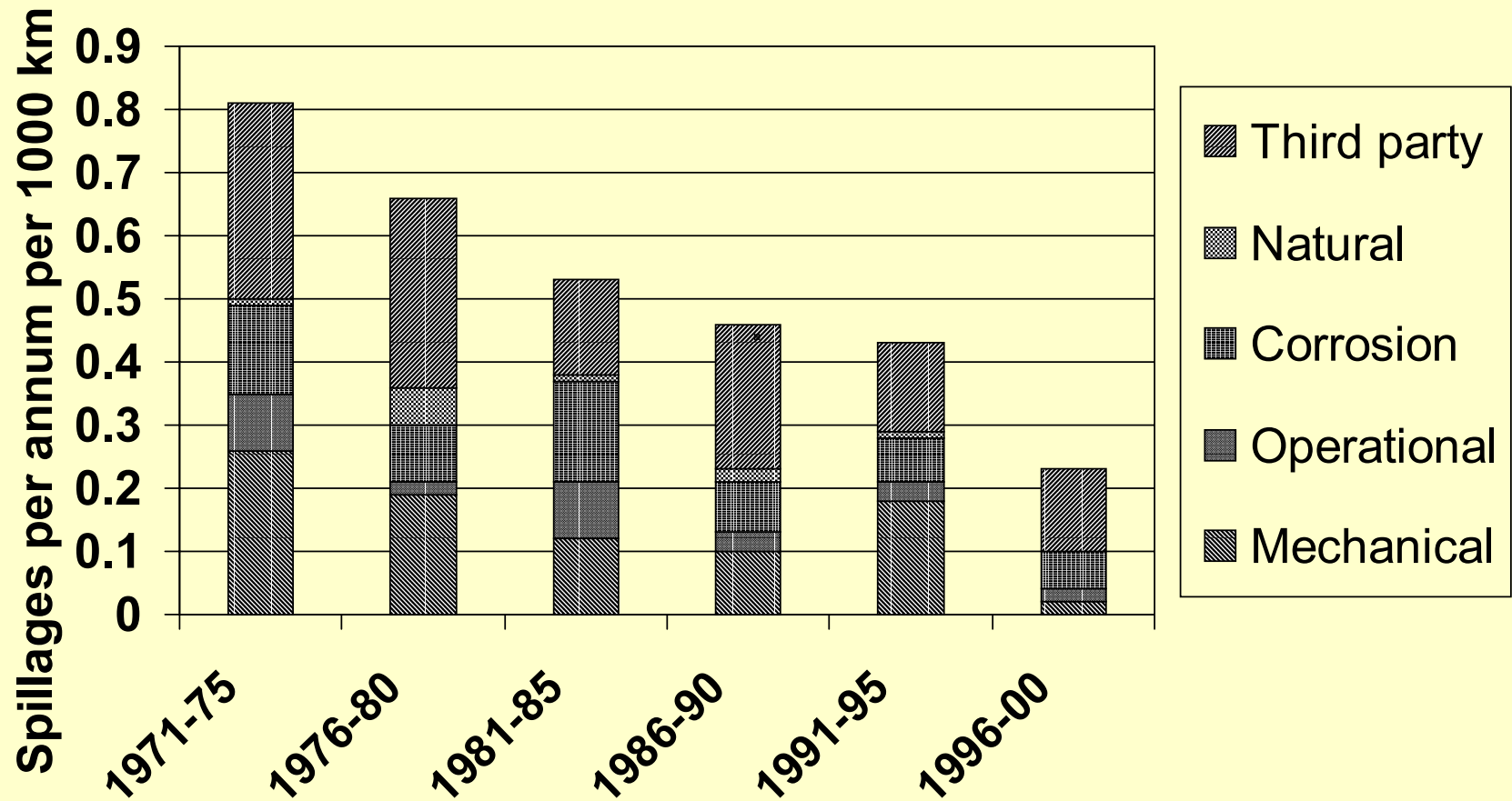
This has been achieved in the context of an ageing network



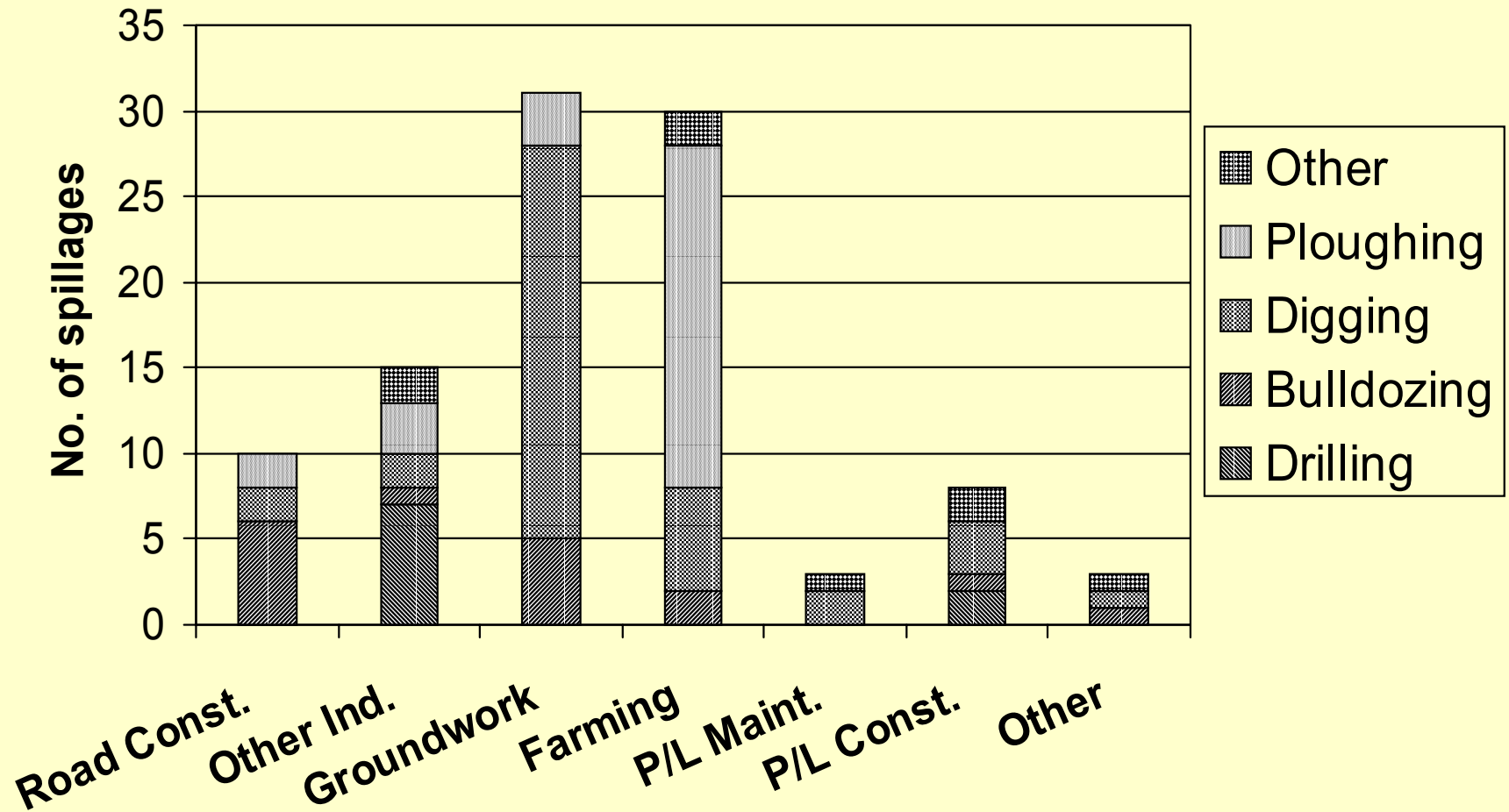
This is partly the result of the use of increasingly sophisticated inspection techniques such as intelligence pigs



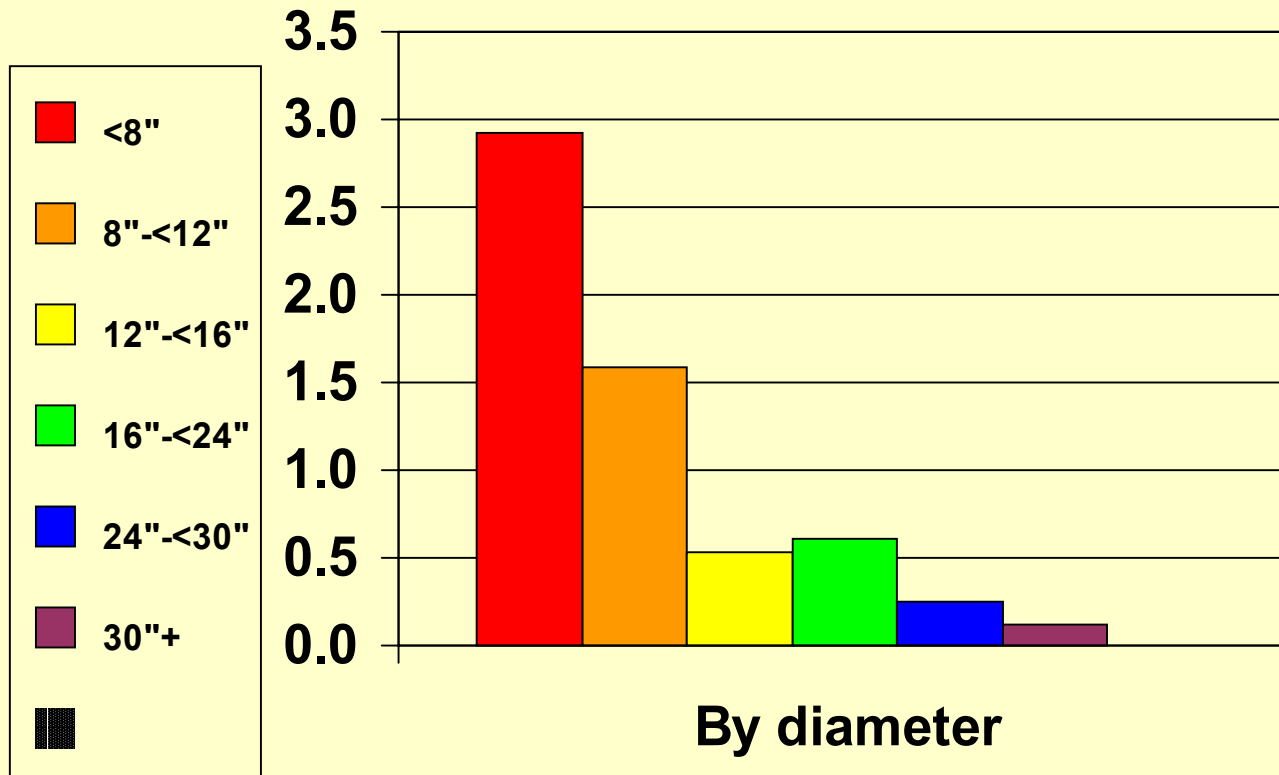
Spillage incidents from all causes have decreased but third party interference is now the main cause



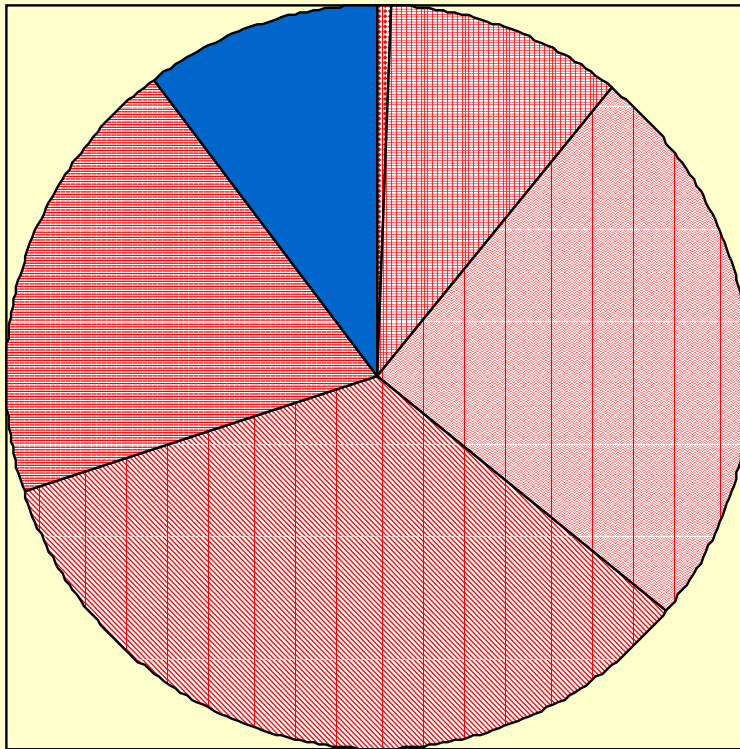
Causes of third party accidental spills



Relative frequency of third party accidental spills by diameter



Ground area (m²) affected by spill % of number reporting



Area (sq metres)

- 100,000+
- 10,000 to <100,000
- 1000 to < 10,000
- 100 to < 1000
- 10 to < 100
- <10

Impact of pipeline spills on water (1993-2002)

- Number of Spills 98
 - Number Affecting Water 8
- Of these:
- Surface Water 7
 - Groundwater 1
 - Potable Water 2
 - Most had limited impacts

Safety

- In 30 years 2 injuries and 14 fatalities have been reported in 7 separate pipeline leakage events.
- All but one of these fatalities occurred as a result of hydrocarbon ignition during the subsequent repair or remediation activities.
- All casualties were directly connected with these activities and members of the general public were not affected.

Concluding remarks

- Crude oil and oil product pipelines play a major part in the supply of fuels to EU markets
- They are a very safe mode of transport
- Spillages do occur
 - Most of them are minor
 - Major ones can lead to large areas of soil contamination and occasionally water contamination
 - Thorough clean-up is always undertaken
- The number and severity of spills has decreased over the years
- Most spills are the result of third party actions