**E**uropean **G**as Pipeline **I**ncident data **G**roup

# EGIG

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- EGIG: input
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# What is EGIG?

# 12 operators organize incident statistics

- **European operators** of gas transmission pipeline systems
  Belgium Czech republic Denmark Germany Finland
  France Italy Netherlands Portugal Spain Switzerland UK

- **Covering and exposure**
  122.000 km 1970 – 2004 2,8 milion km. yr

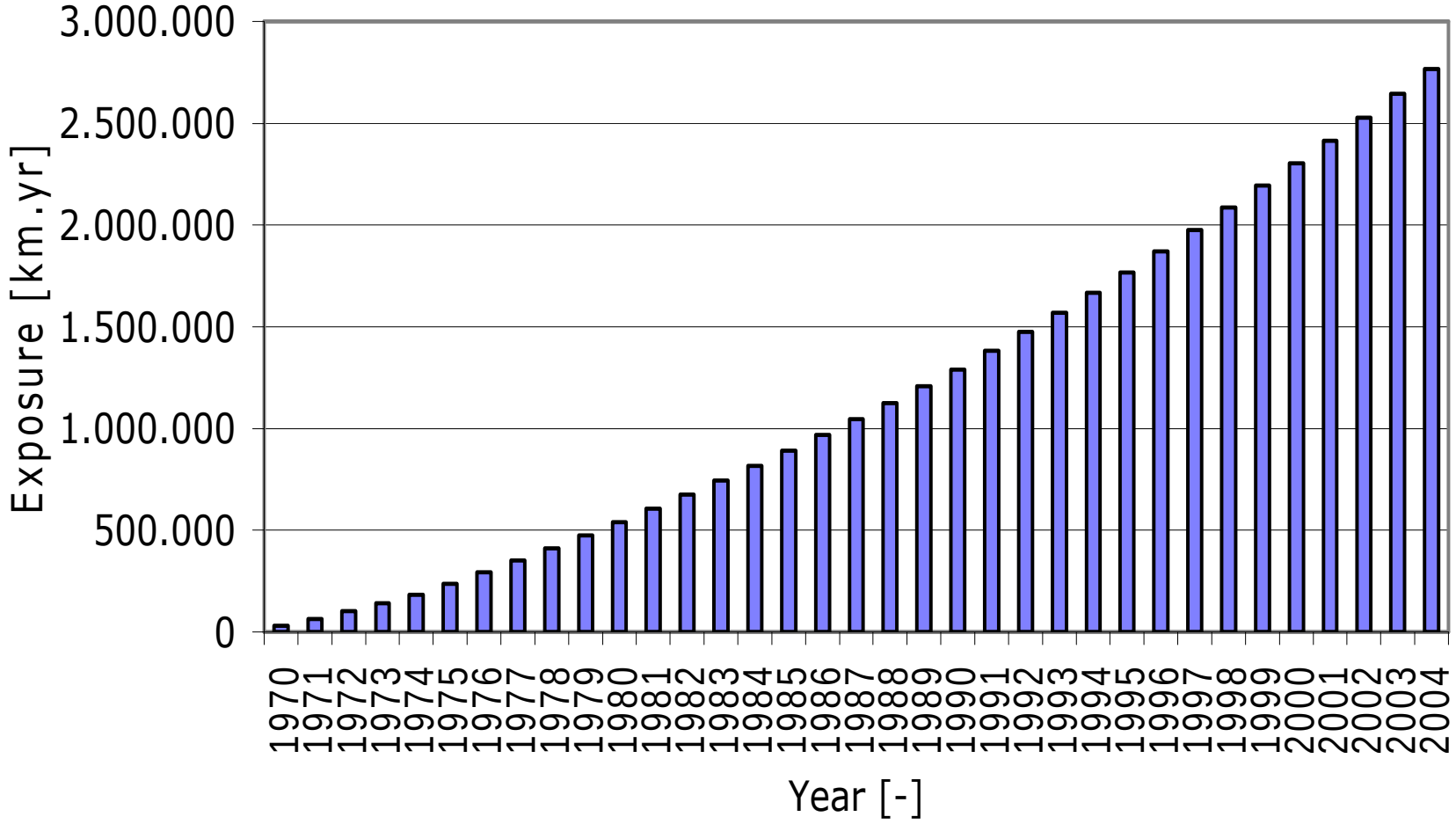
- **Report**
  > Every 3 years
  > 6th report is placed on the internet (WWW.EGIG.nl)

# Objectives of EGIG

- To communicate about the safety performance
- Provide a reliable and realistic picture of incident frequencies

- Basis for statistical use
- To analyse the causes of incidents
- To improve safety performance

# Evolution of the exposure



# EGIG: The input

# Defined System and defined incidents

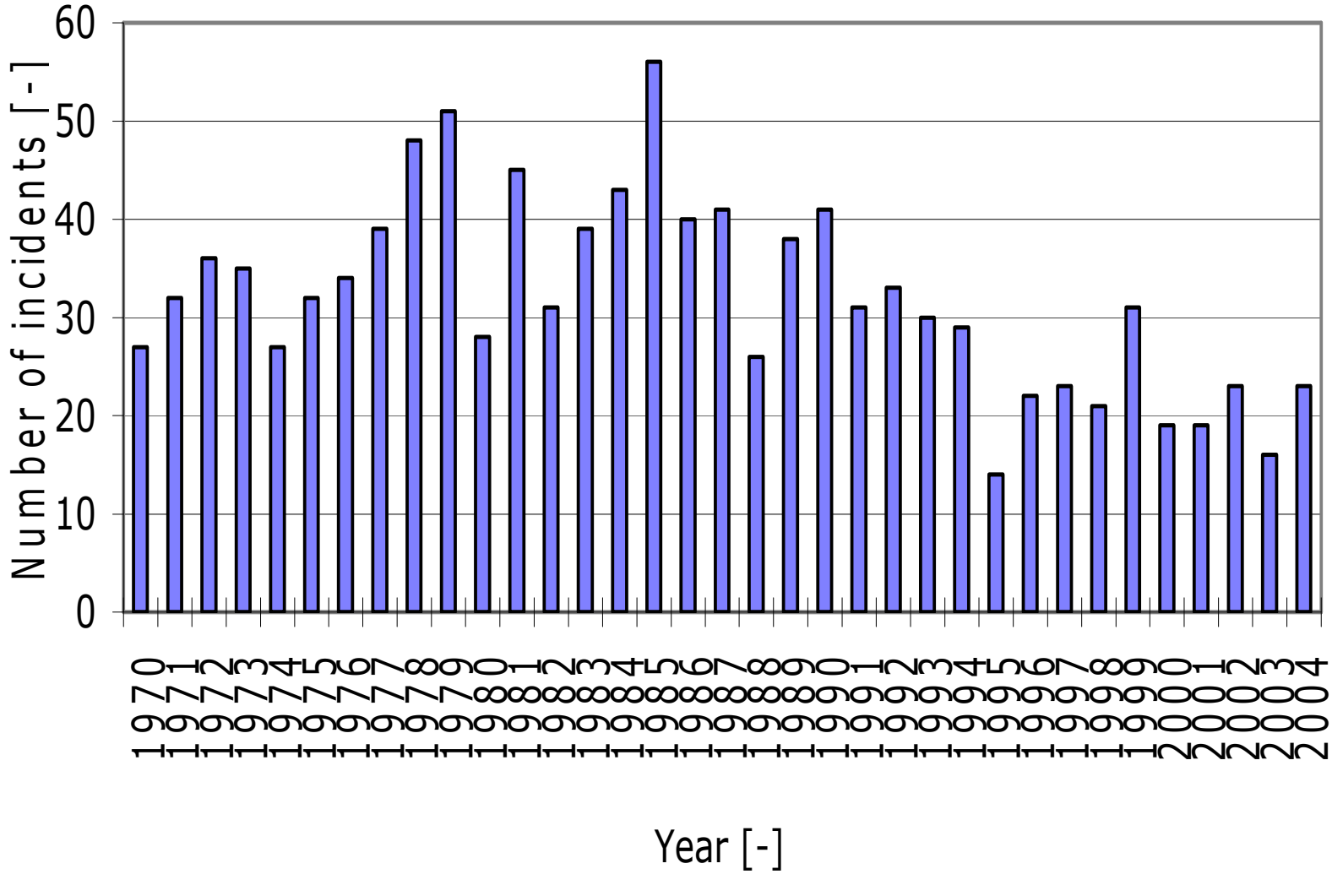
## System

- Transport of gas
  - > Steel transmission pipelines >15 bar
  - > Outside the fences of installations
  - > Onshore

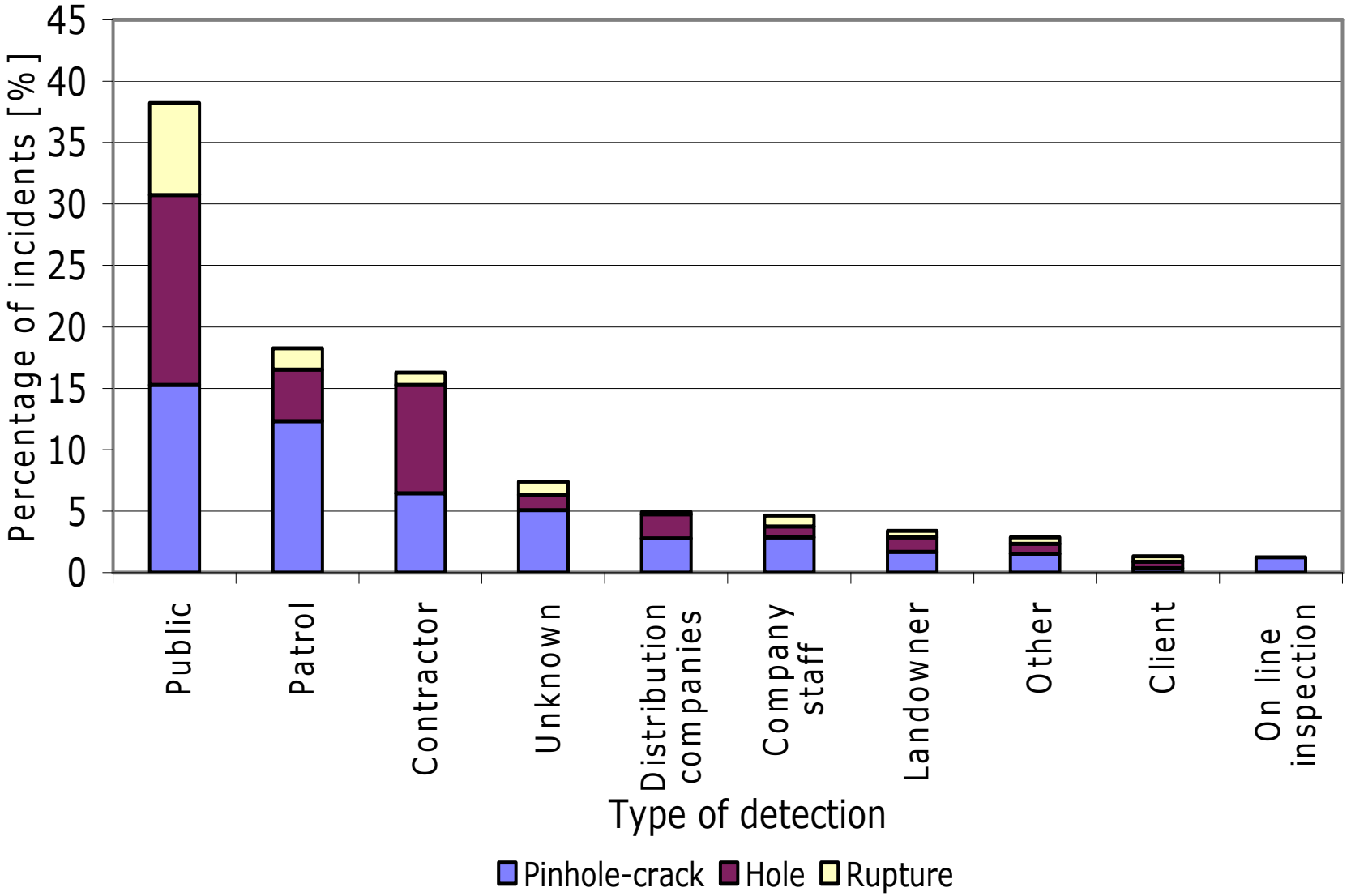
## Incidents

- Incidents with unintentional release

# Annual number of incidents



# Detection of incidents



# The EGIG parameters

**System**

- Diameter
- Pressure
- Year of construction
- Type of coating
- Cover
- Grade of material
- Wall thickness

**Incidents**

- How detected
- Leaksize
- Cause of incident
- Ignition
- Consequences
- A free text

# EGIG: The output

# The EGIG figures output

**Failure frequencies, distributions and/or probabilities**

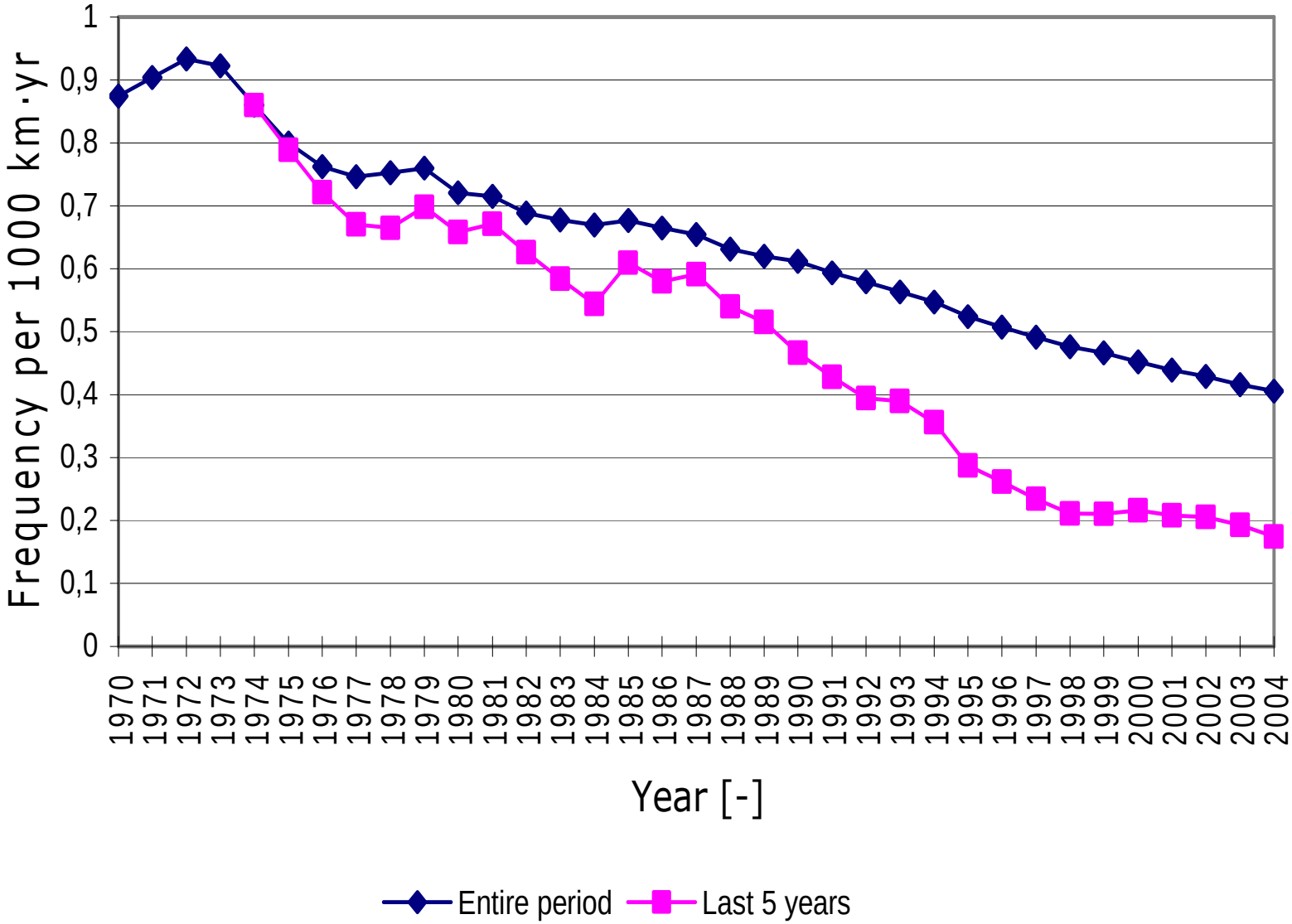
- Calculated from total exposure and 5 year moving average to observe trends and also to observe the distribution of incidents and leaksize per cause.

- Calculated from partial exposure
  to observe influence of design parameters on the causes and consequences of incidents.

# General Incident failure frequencies

| Period [year] | Number of Incidents [-] | System Exposure [km.year] | Failure frequency [per km.year] |
|---|---|---|---|
| 1970-2004 | 1123 | 2.770.000 | **0,00041** |
| 1970-2001 | 1061 | 2.410.000 | **0,00044** |
| 2000-2004 | 100 | 570.000 | **0,00017** |
| 2004 | 23 | 122.000 | **0,00019** |

# Evolution of the primary failure frequencies



# Estimated probabilities per leak size

| Size of leak | ignition probability |
|---|---|
| Pinhole or crack | **0,03** |
| Hole | **0,02** |
| Rupture < = 16” | **0.09** |
| Rupture > 16” | **0,30** |

# Using these figures for risk analysis

- Decisions on **future** developments depend on **historical** statistical data
- EGIG statistics are used **together** with other parameters which are based on poor or even no knowledge
  - **Ignition probability,**
  - **Probability of being exposed,**
  - **effect-consequence relations**
  - **Etc**
- **Not everything** (measure or situation) can be quantified
- Used as an additional method in certain countries:
  Shall give **different** national demands
- Misused for far-reaching decisionmaking:
  because **QRA has significant limitations**.

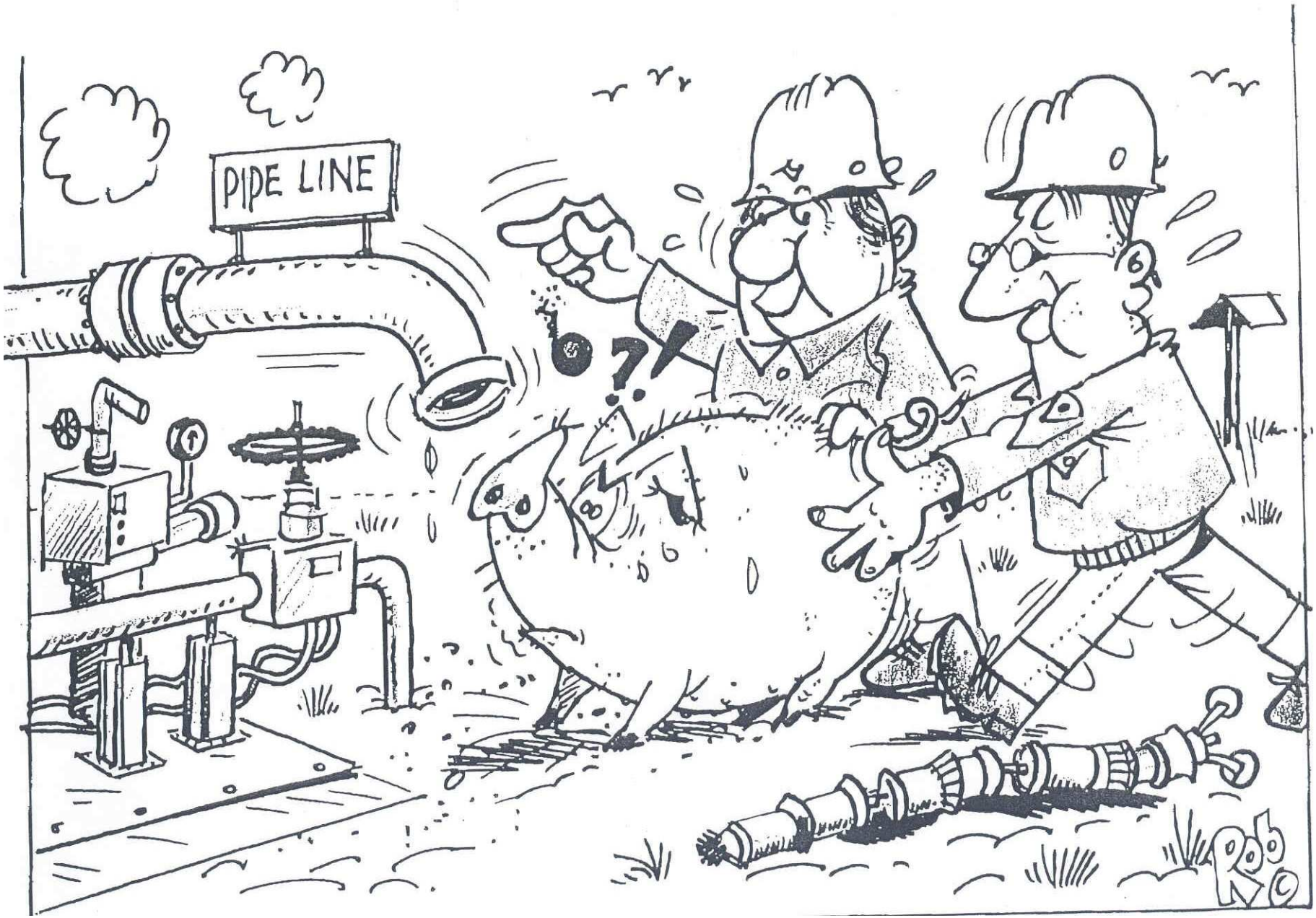
# Pipelines compared to other transportmodes

A pipeline is safer (per ton.km) if:

- ca **5000** tankcars
- ca **2000** railroad tankcars
- ca **1000** inland waterway vessels

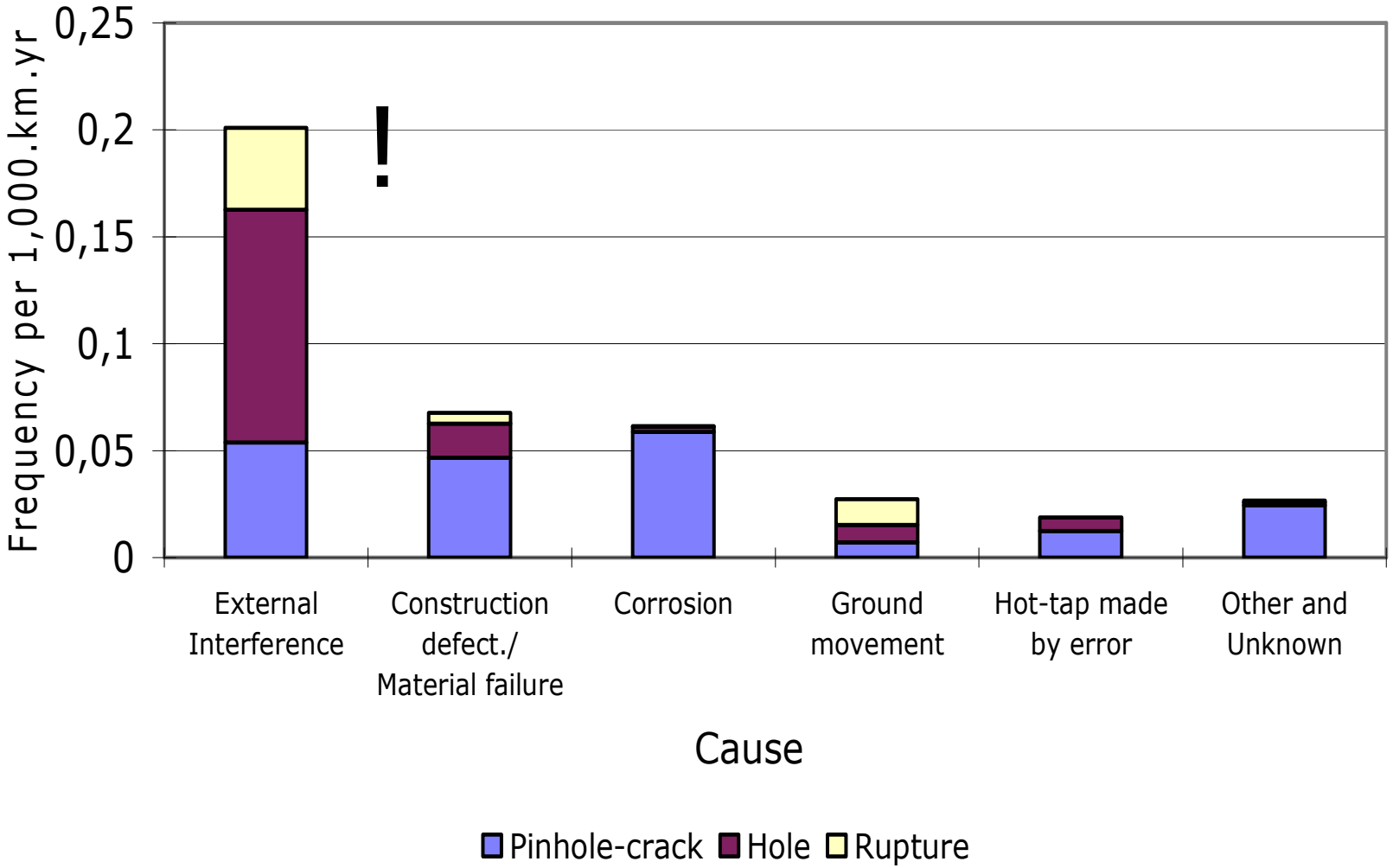
are needed to transport a flammable gas

A pipeline: safest transportmode for continuous mass transport of gas

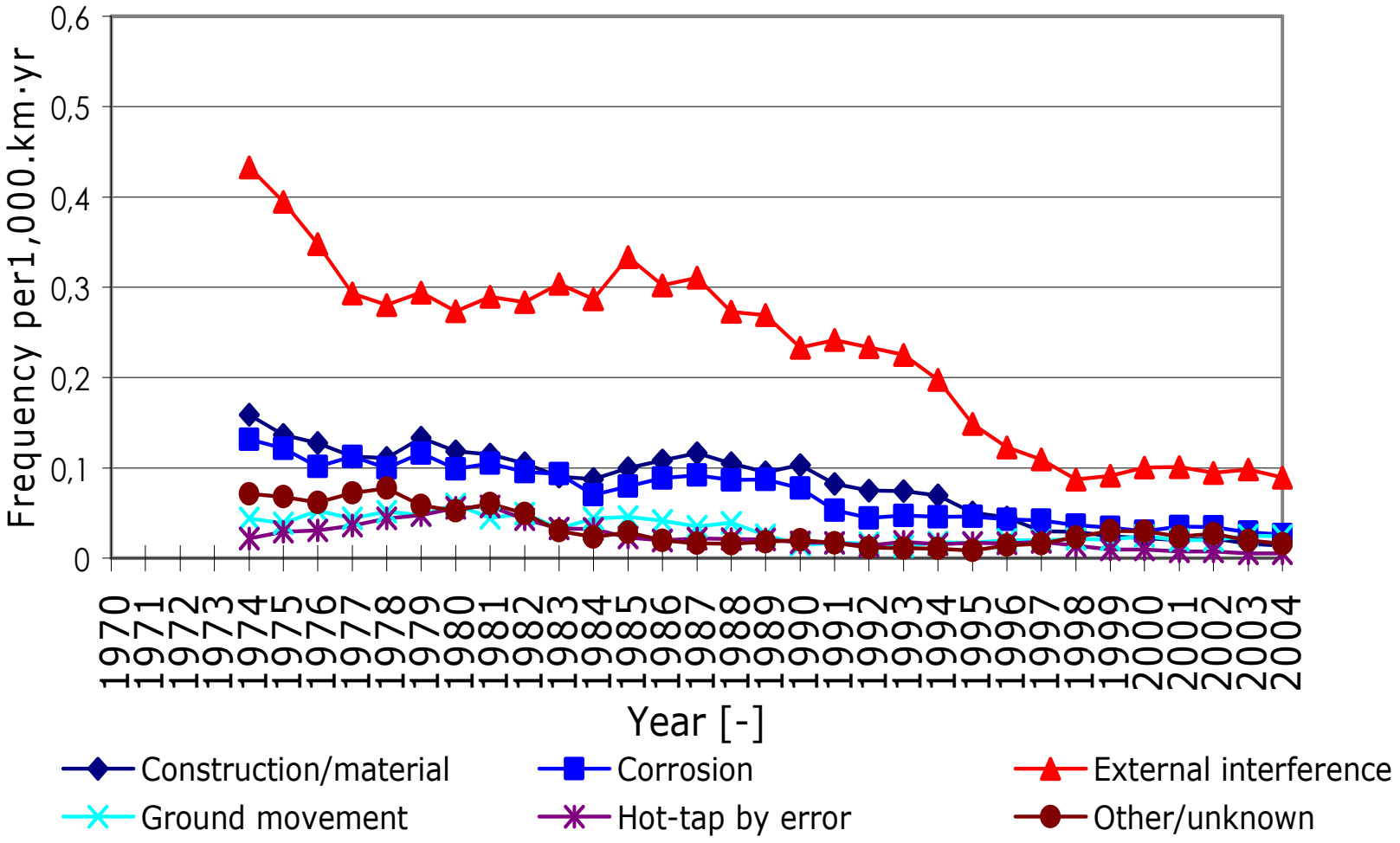

PIPE LINE
?!
Rob
©

# Analysis EGIG figures

# Relation cause-size of leak

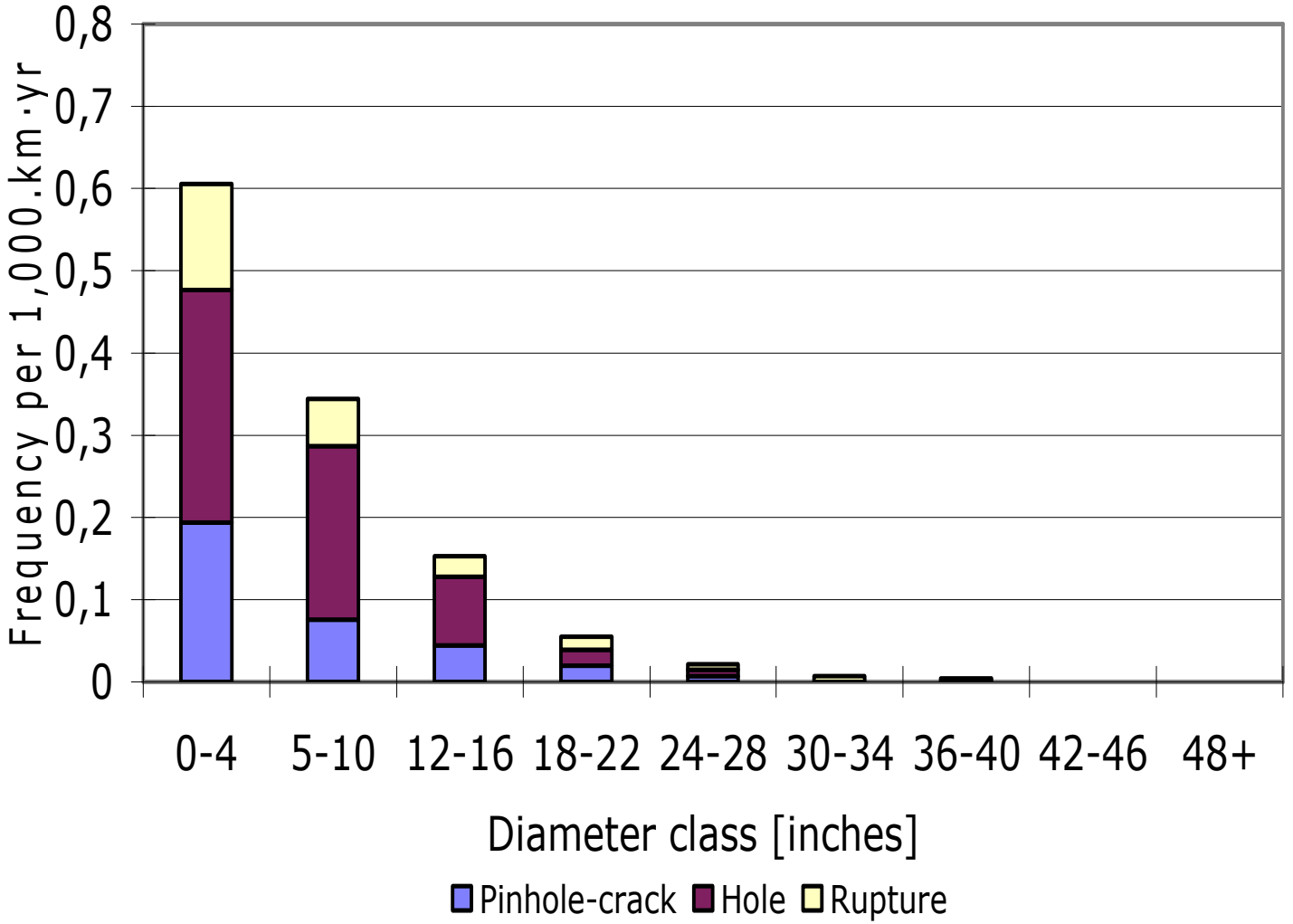


# Primary failure frequencies per cause
## (5-years moving average)



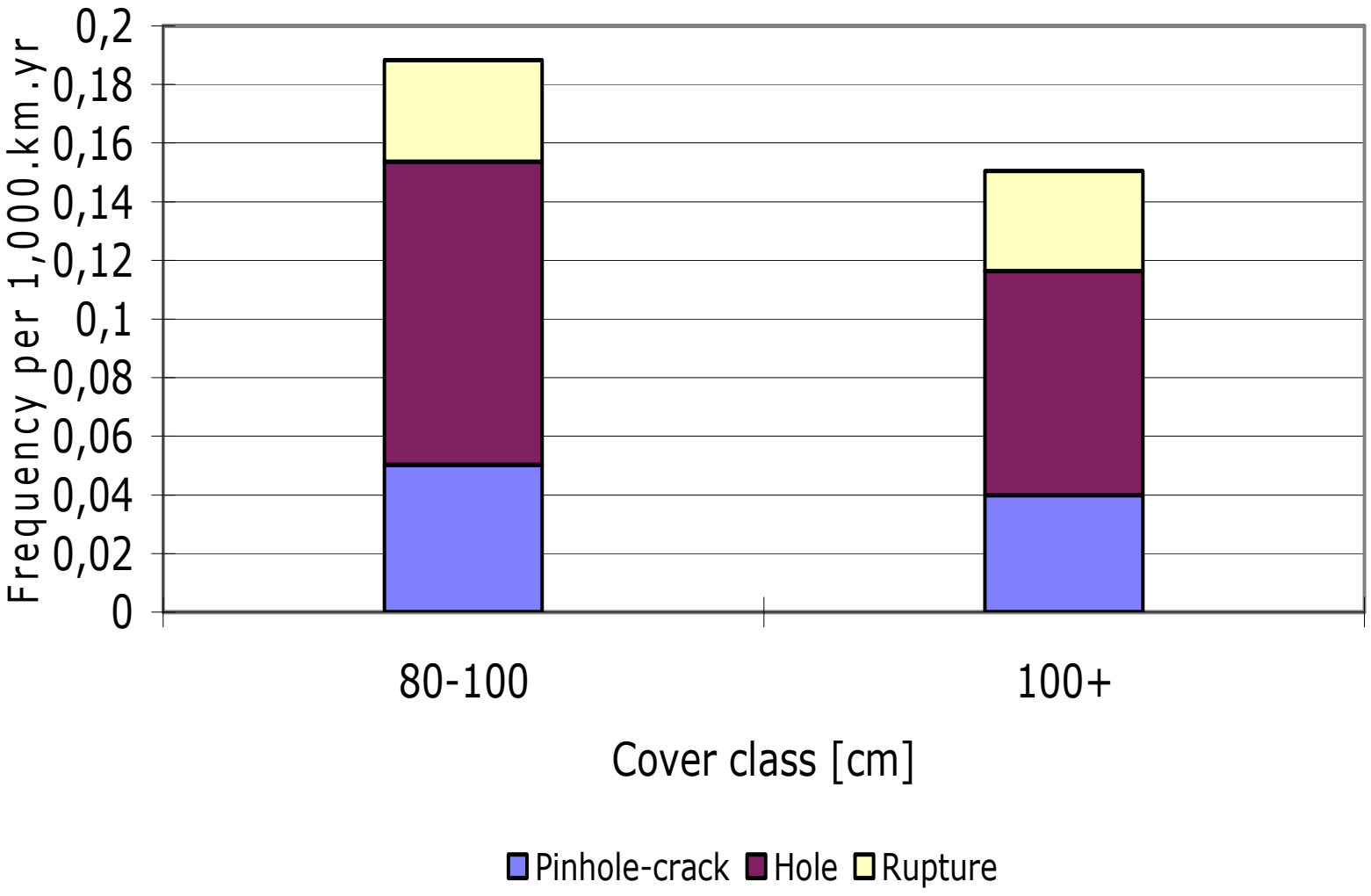

VOLVO
EC210

# External interference:
## diameter class and size of leak

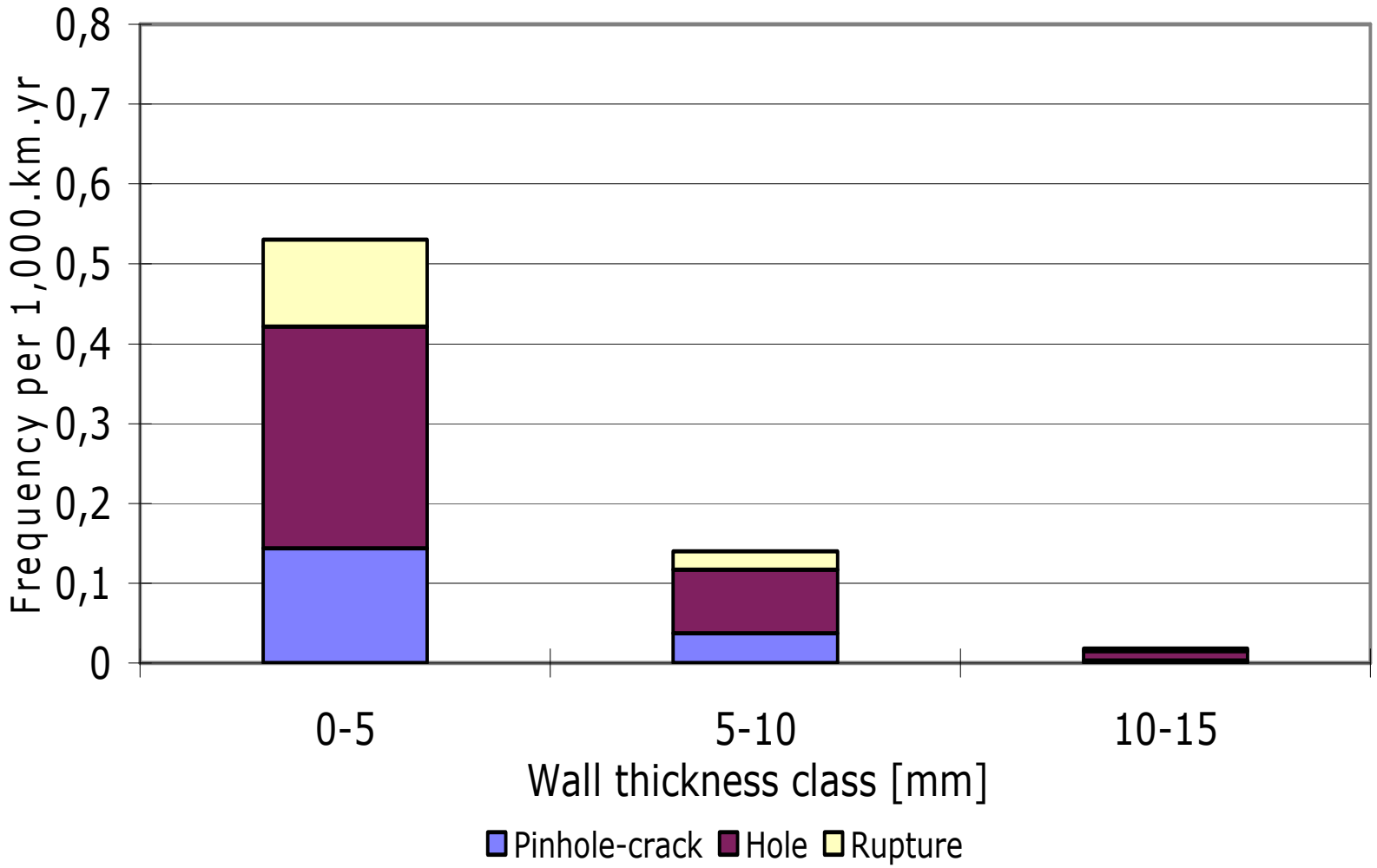


# External interference:

## Depth of cover class and size of leak

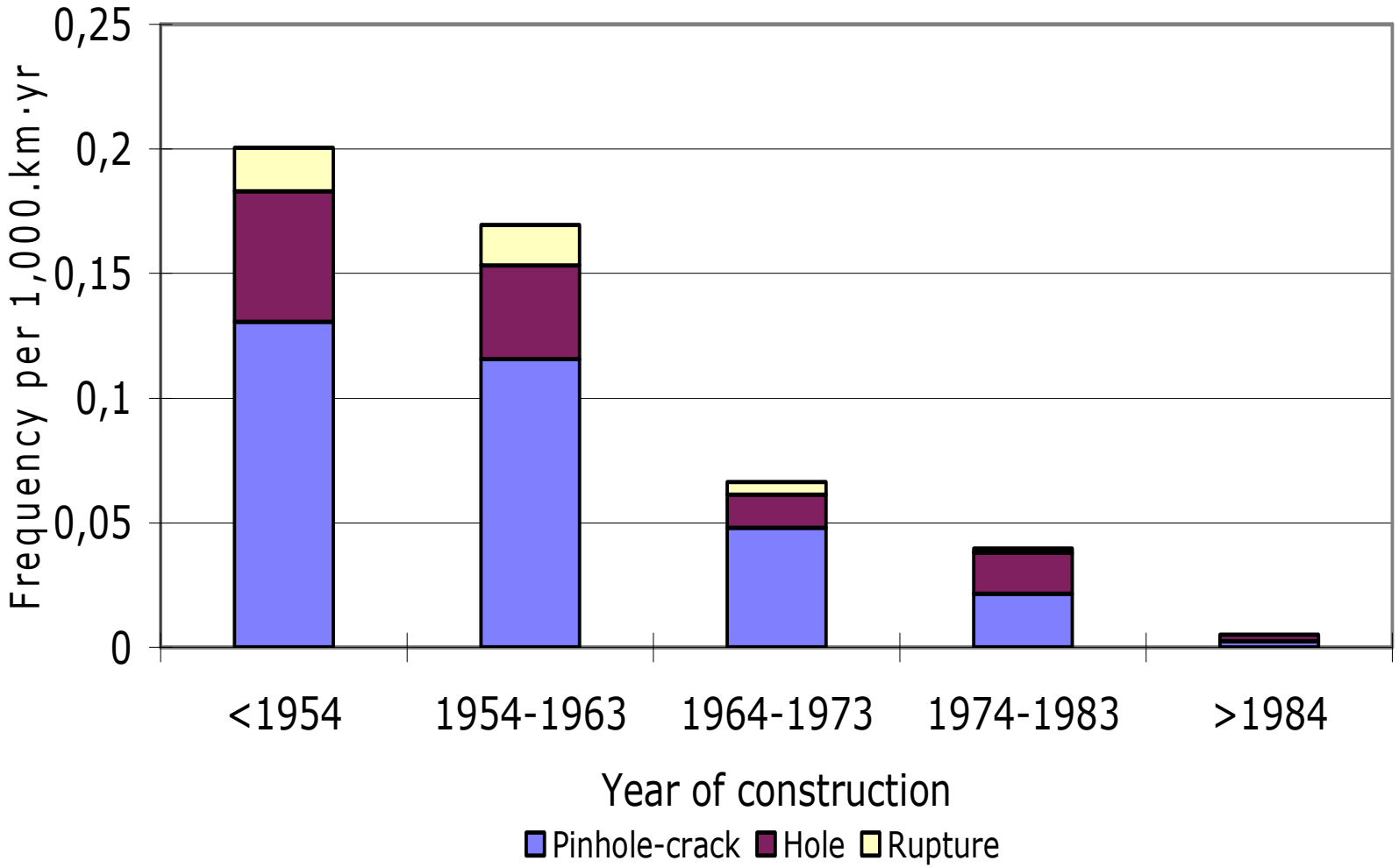


# External interference:
## wall thickness class and size of leak



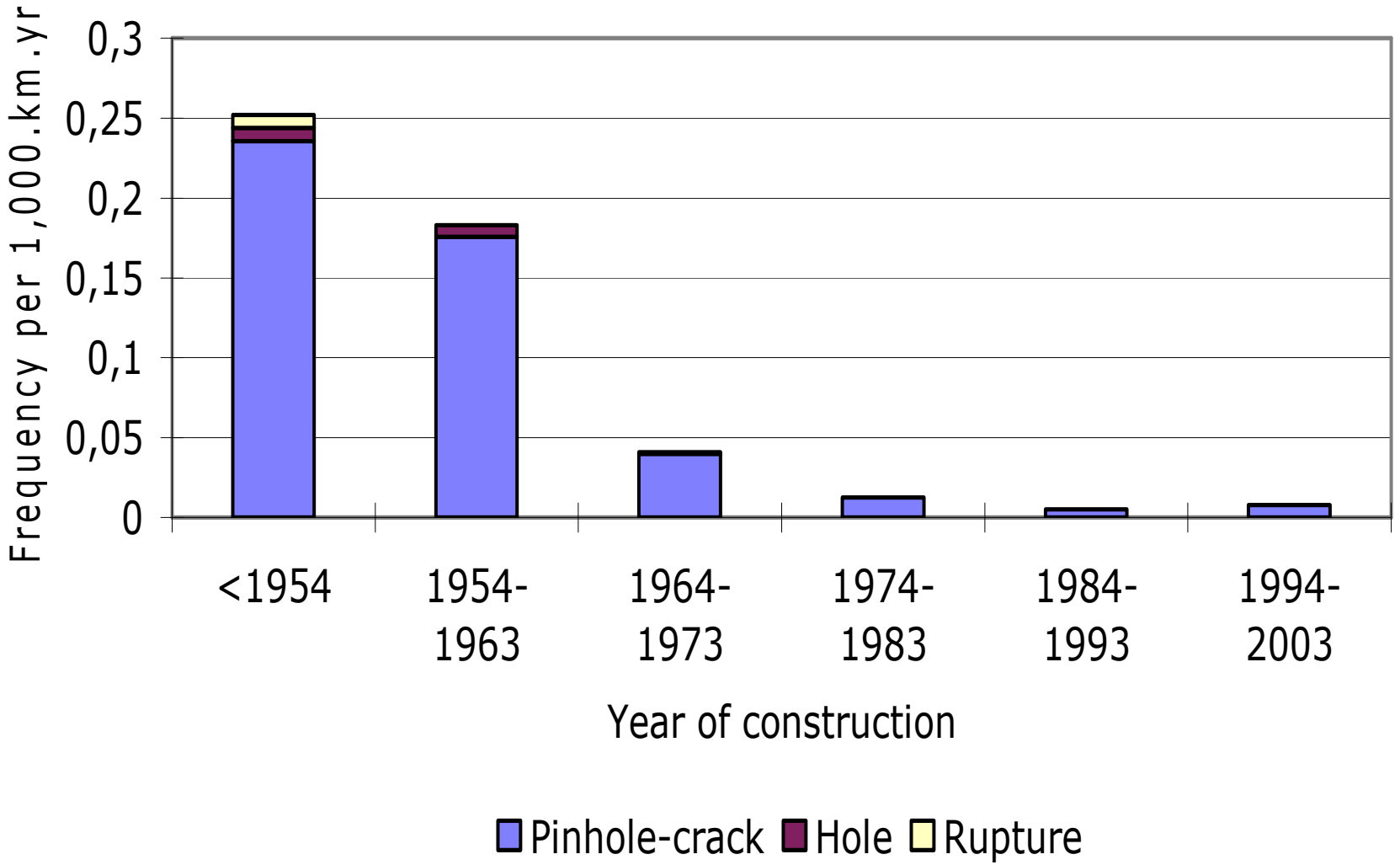
# Construction:

## Year of construction and size of leak



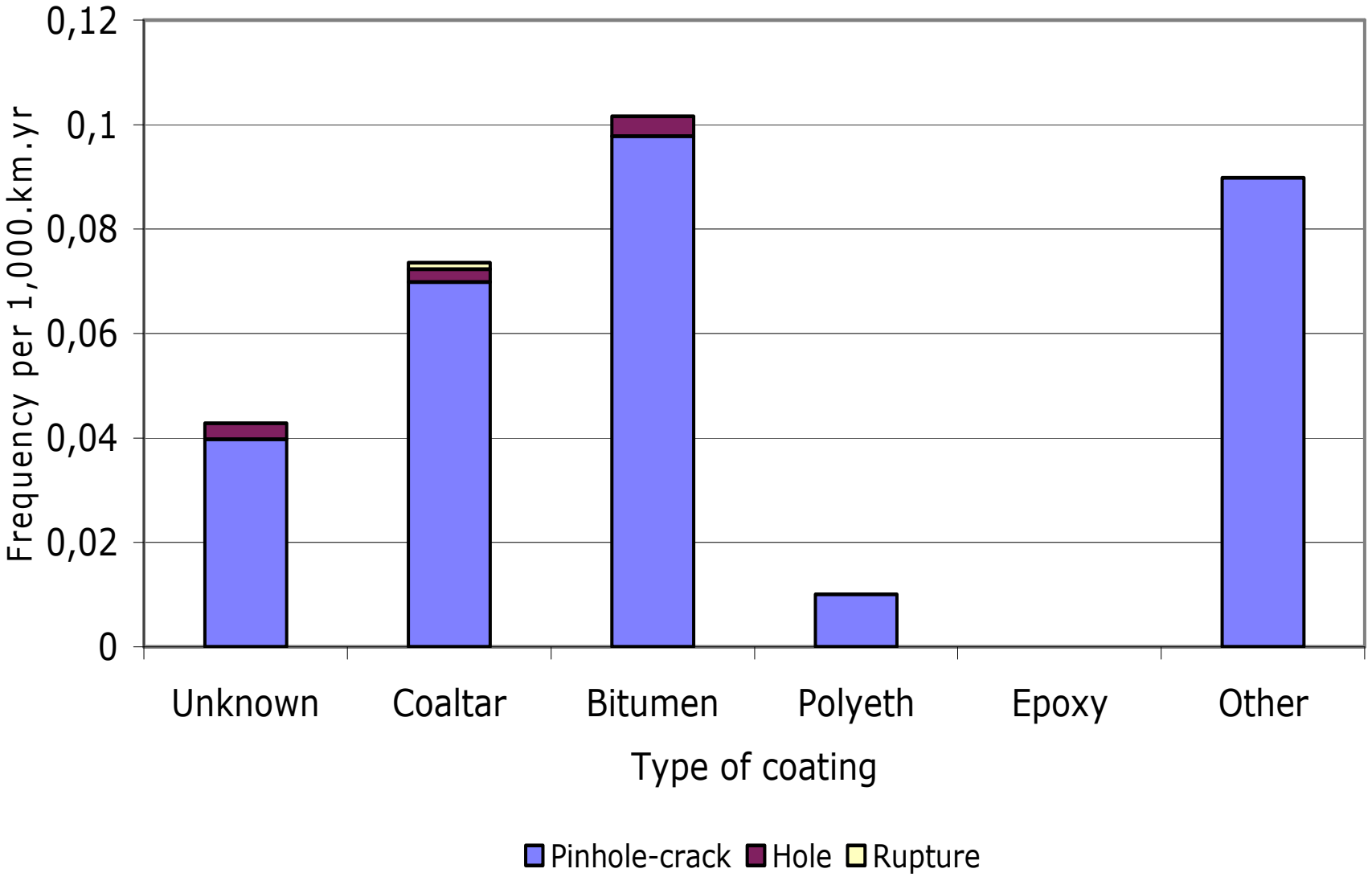
# Corrosion:

## year of construction and size of leak



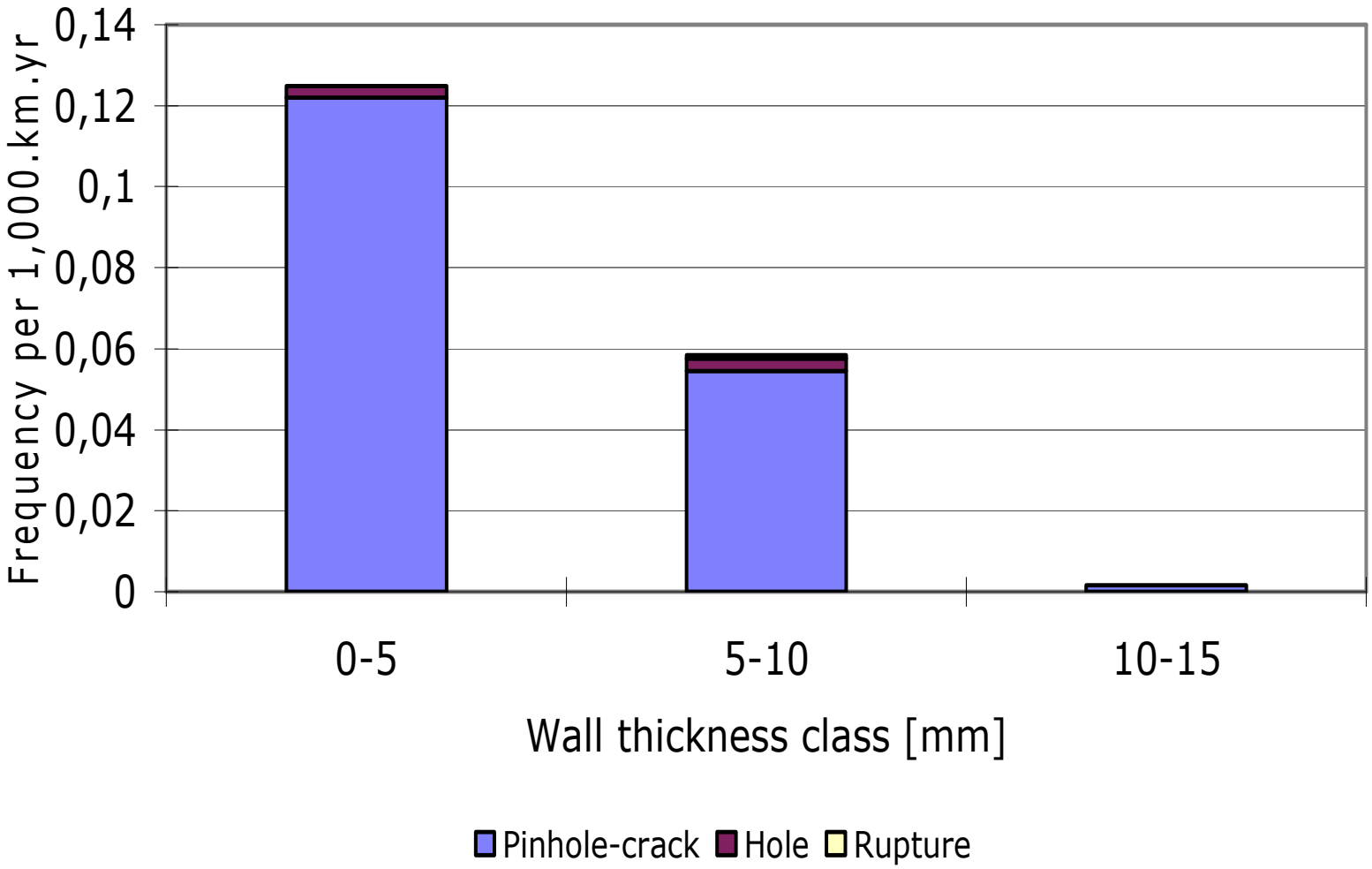
# Corrosion:

## Coating and size of leak



# Corrosion:

## wall thickness class and size of leak



# Analysis of these figures

- **External interference**
  - **75**% of serious incidents
  - And 90% of these incidents: <10mm wall th. <28” diam.
- **Ground movement**
  - **10** % of serious incidents
  - And 90% of these incidents: <10mm wall th. <1975
- **Construction**
  - **10**% of all incidents
  - And 90% of these incidents: <1983
- **Corrosion**
  - 1 % of serious incidents
  - And 90% of these incidents: <1974

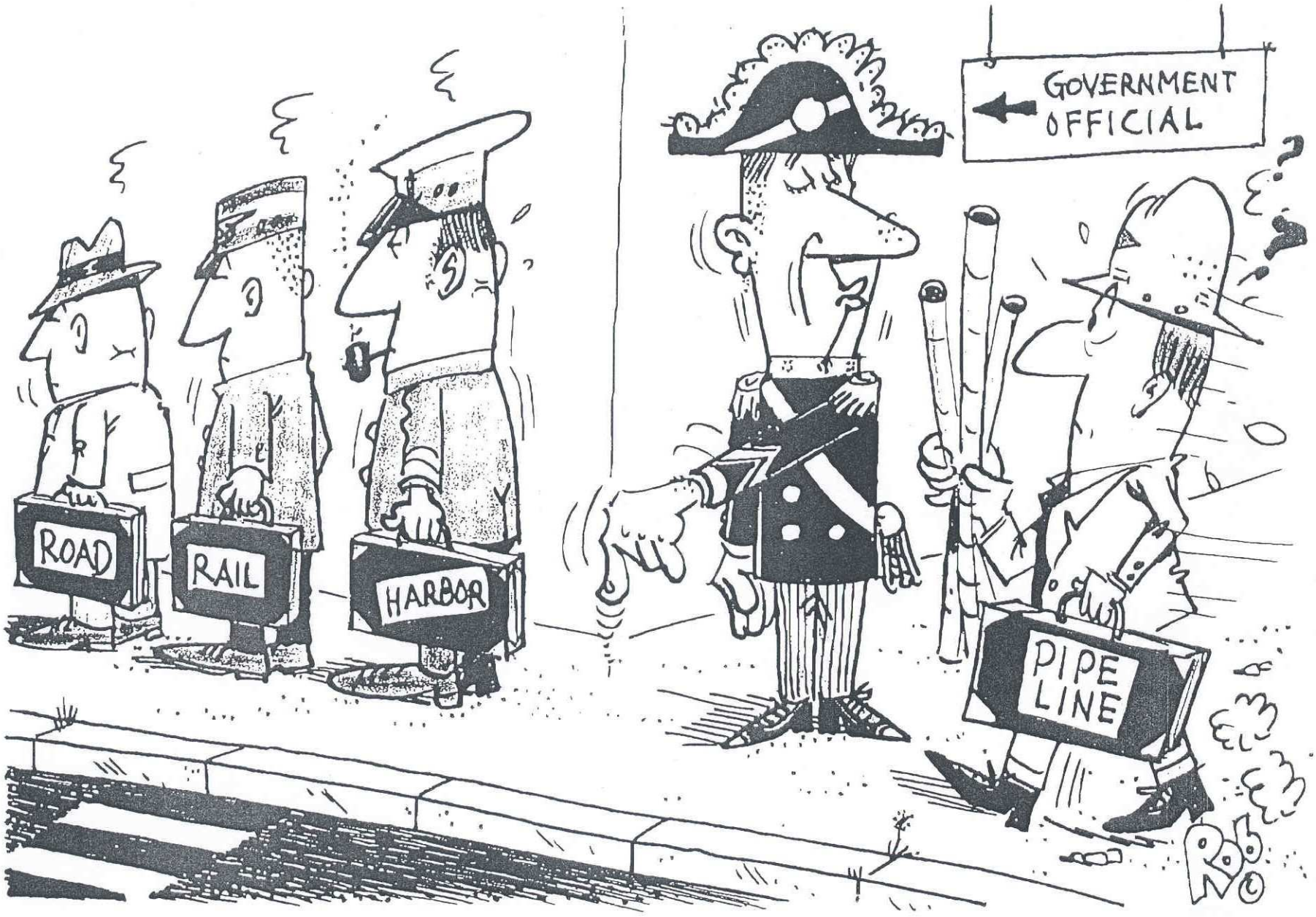
# Conclusions
# &
# Recommendations

# Conclusions and recommendations

- **Pipelines: a safe transportmode**
  - most recent overall incident frequency 0,00017 [per km. year]
  - the failure frequency seems to stabilize.
  - A safe alternative in the case of mass transport

- **Integrity**
  - 10-20% of all serious incidents
  - international standards,
  - primarily a responsibility of the operator
  - pipelines must be treated as transport

- **External interference**
  - **> 75 %** of all serious incidents
  - We have still a job to improve.
  - As traffic safety also a responsibility of authorities


GOVERNMENT OFFICIAL
ROAD
RAIL
HARBOR
PIPE LINE

# Questions?