

Reducing Third Party Damage to High Pressure Pipelines

Neil Jackson

Policy Manager, Transmission

UKOPA/08/0023

nationalgrid

Introduction

- ◆ Overview of National Grid
- ◆ Process Safety
- ◆ Third party interference
- ◆ Current measures to prevent third party interference
- ◆ What more can pipeline operators do?
- ◆ A possible benchmarking process

Who are National Grid?

- ◆ Between 1997 and 1999 British Gas was restructured to form:
 - Lattice of which Transco was a part (Gas Transportation and Distribution)
 - Centrica (Gas Supply)
 - BG plc (Exploration and Production)
- ◆ 2002 Lattice Group merged with National Grid (electricity transmission company in the UK) to form National Grid Transco which became National Grid in 2005
- ◆ Now the largest Utility in the UK and the second largest in the US

National Grid has assets principally in the UK and US

		
Gas	7,200 km Transmission pipelines 148,000 km Distribution pipelines (own and operate 4 of the 8 Distribution Networks in the UK) 11 million customers	50,700 km Gas Distribution pipelines on the Eastern Seaboard 3.4 million customers
Electricity	7,900 km of Transmission lines in England and Wales	13,700 km Transmission pipelines 114, 263 km of Distribution pipelines 6,650 MW Generation 4.4 million customers

Current Concerns in the UK Over Process Safety

- ◆ Companies trying to improve their safety performance have tended to focus on occupational health and safety
- ◆ An accident at the BP Texas City refinery on March 23, 2005 resulted in 15 deaths, more than 170 injuries and significant economic losses
- ◆ An Independent Safety Review Panel, chaired by James Baker investigated the effectiveness of BP's safety management systems and its corporate safety culture
- ◆ The findings of the investigation highlighted the lack of focus at a senior level within BP on process safety issues
- ◆ In the UK incidents at Grangemouth oil terminal and the Buncefield oil storage depot raised similar issues and has sharpened the focus of the UK process industries and the HSE
- ◆ The HSE have recently issued a guidance document in this area

What is Process Safety?

- ◆ Process safety hazards can give rise to major accidents involving the release of potentially dangerous materials and energy
- ◆ These can have catastrophic effects and can result in multiple injuries and fatalities, as well as substantial economic, property, and environmental damage
- ◆ Process safety programmes focus on building layers of control measures to ensure the likelihood of such an incident is low

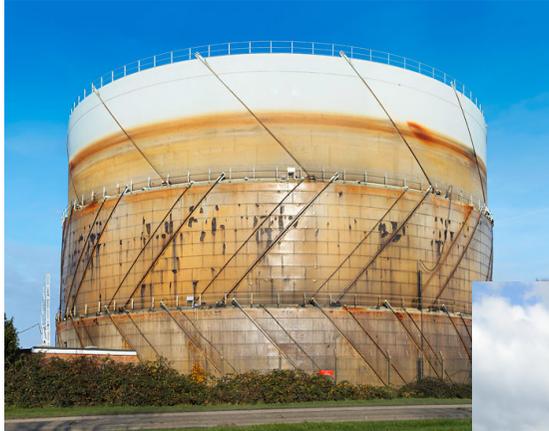


HSE publication

- ◆ The HSE have recently issued a guidance document
- ◆ Developing process safety indicators (HSG 254) A step-by-step guide for chemical and major hazard industries



Process Safety Risks Within National Grid



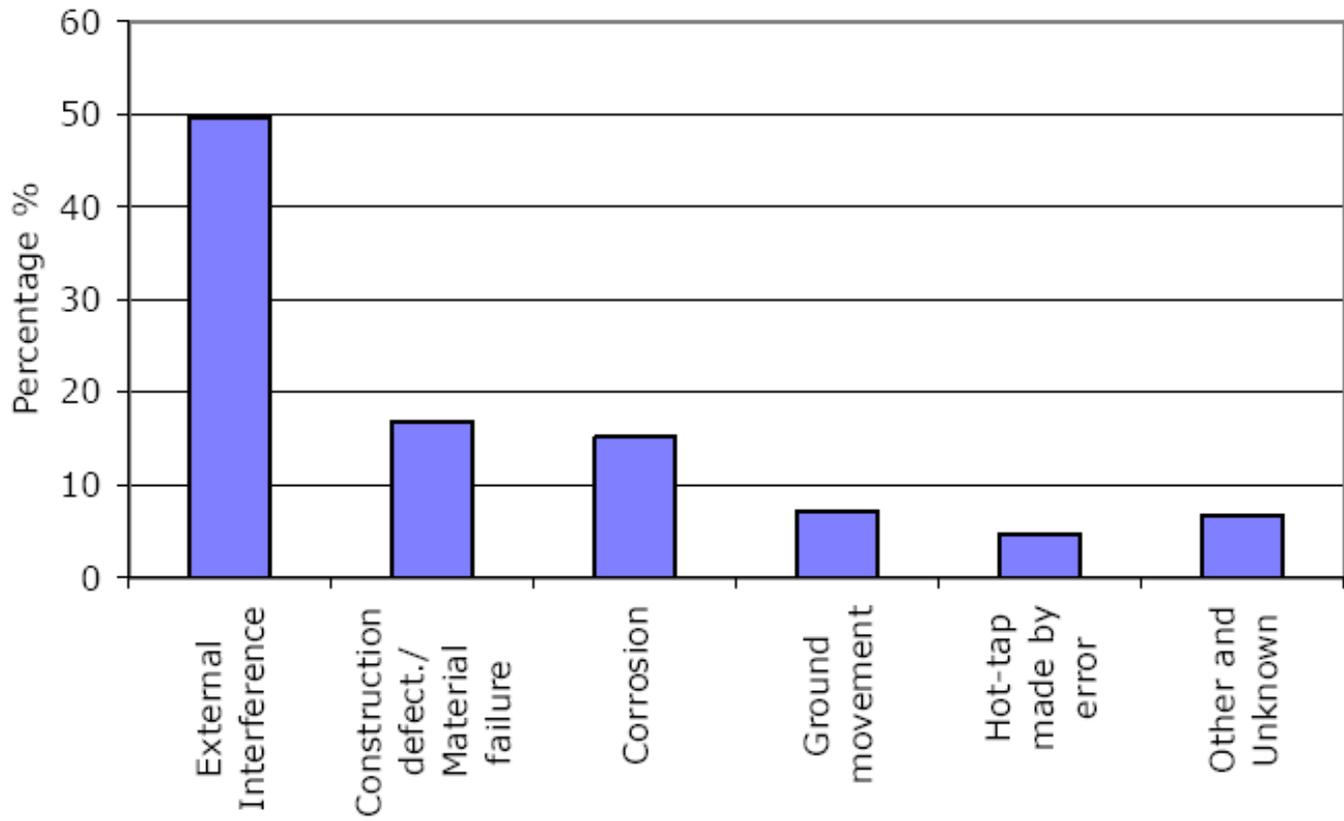
nationalgrid

High Pressure Pipeline Third Party Interference

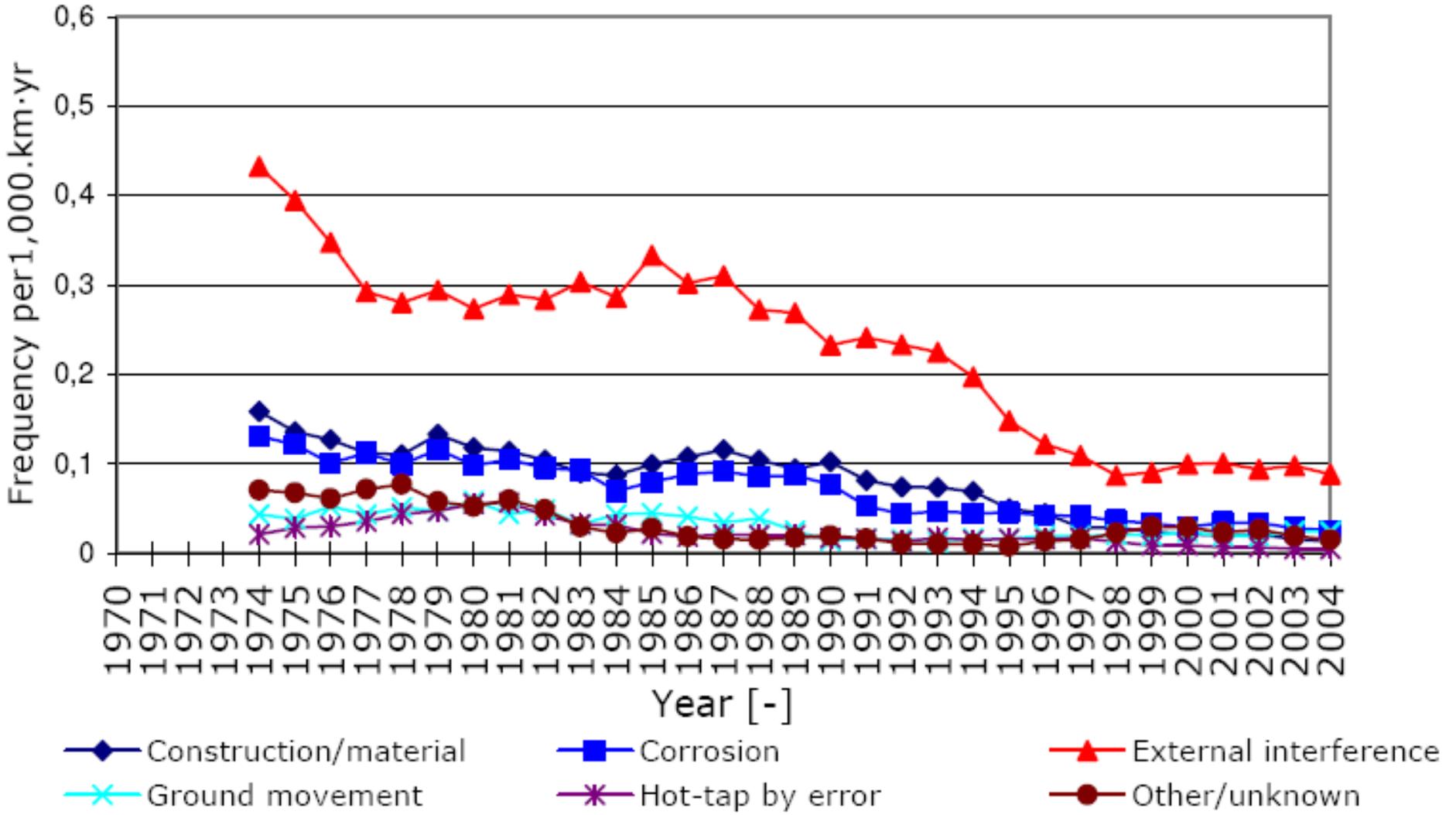
- ◆ The rest of this presentation will take one of the key process safety risks for gas transporters – **third party interference to a high pressure gas transmission line** – and outline a process that can be applied to review whether further measures can be taken to reduce this risk



EGIG data highlights that external interference is the most likely cause of pipeline failure



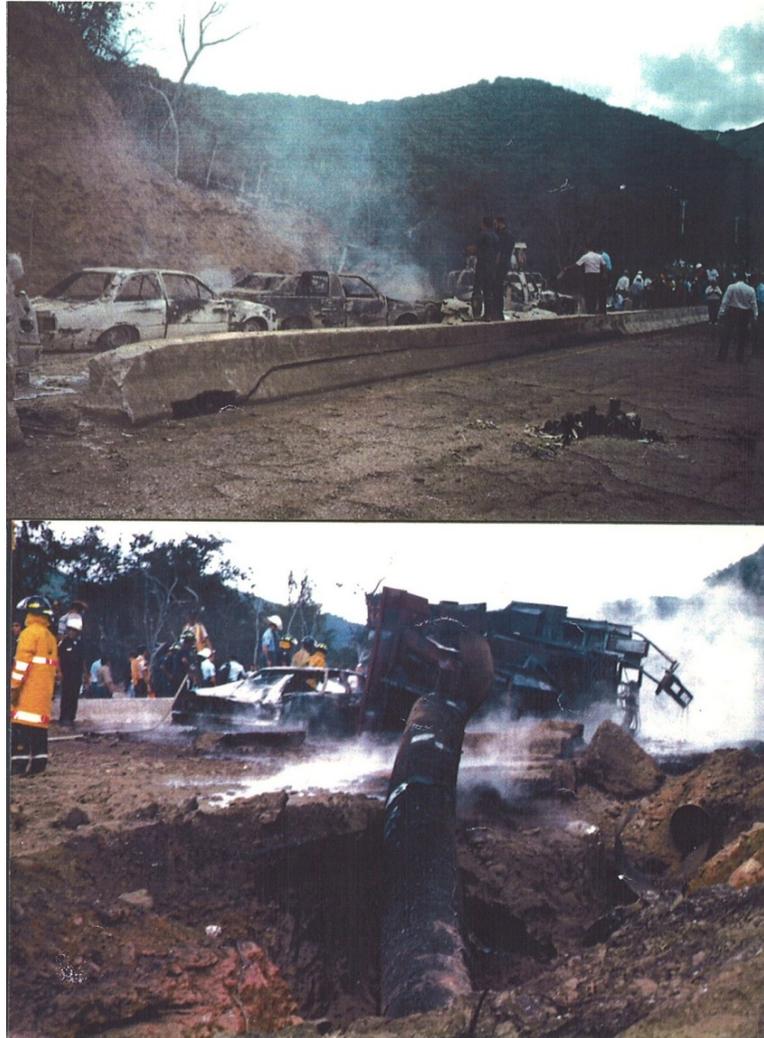
EGIG data also shows a reduction in the rate of external interference incidents (5 year moving average)



Ghislenghien, Belgium 2004



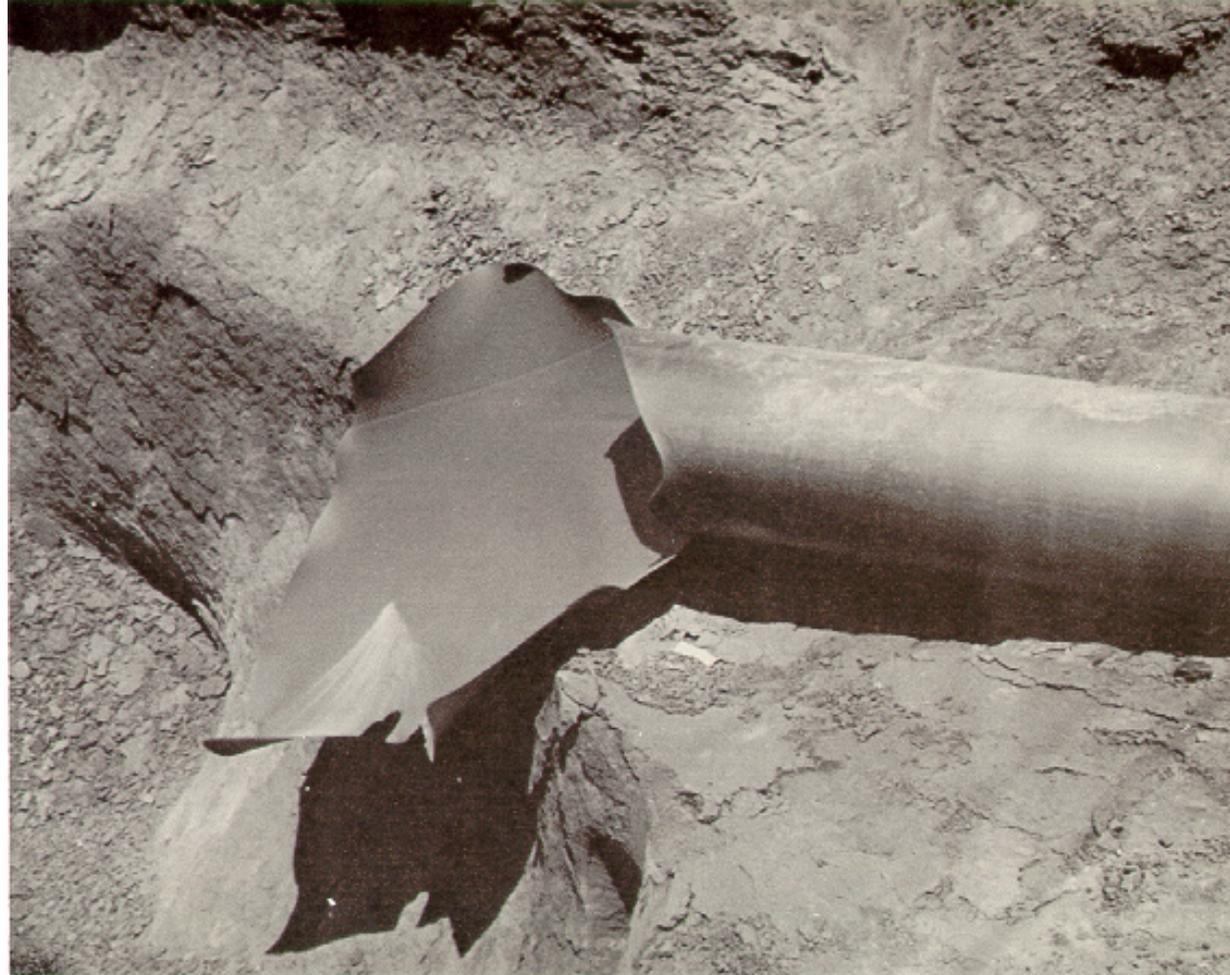
Caracas Venezuela failure 1993 508 mm dia 46 bar interference by rockwheel trencher



Caracas Venezuela cont'd



Cartwright failure in 1976 508mm dia 53 bar interference by road grader

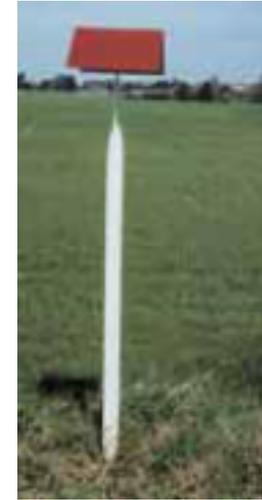


Current Measures

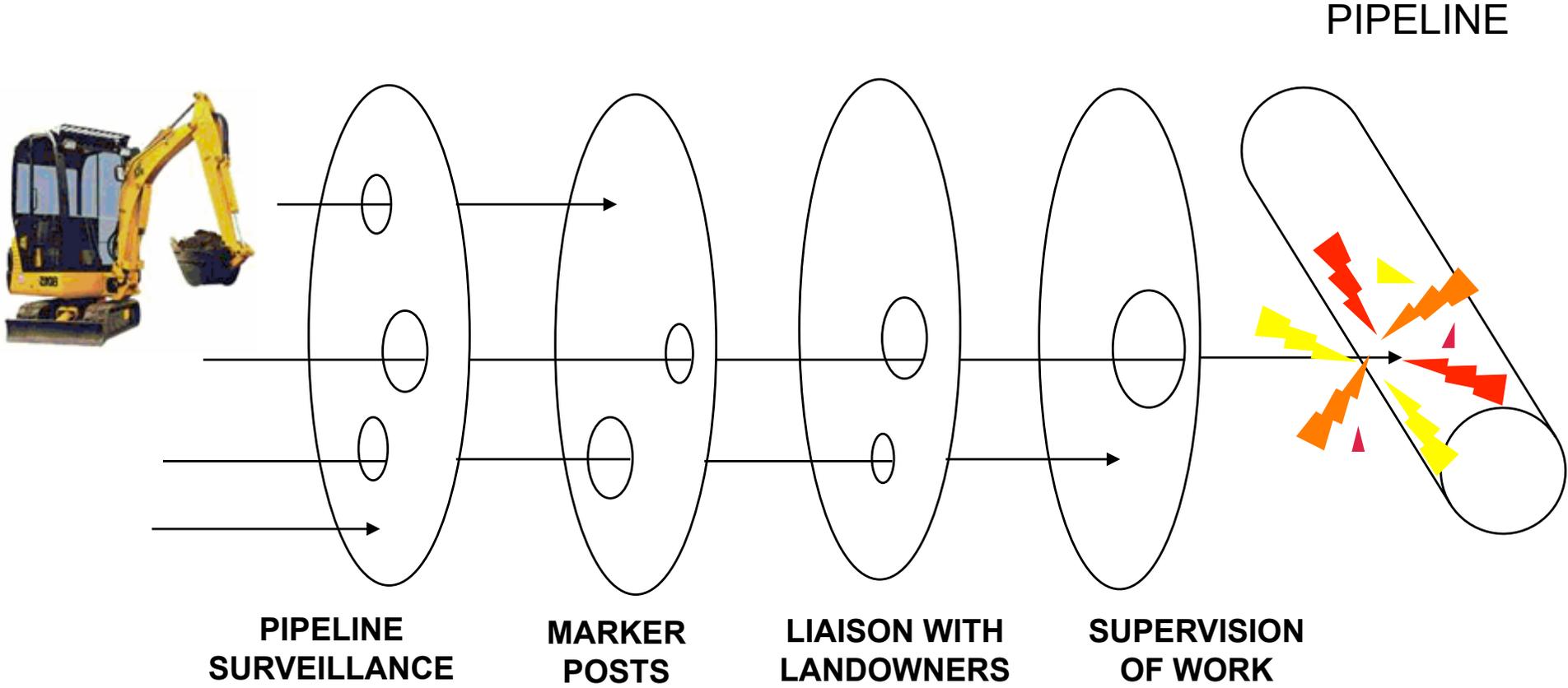
- ◆ Pipeline Standards including EN1594, National Standards and in some countries National Legislation currently requires pipeline operators to take a number of measures to reduce the likelihood of third party interference.

Typical Measures Include

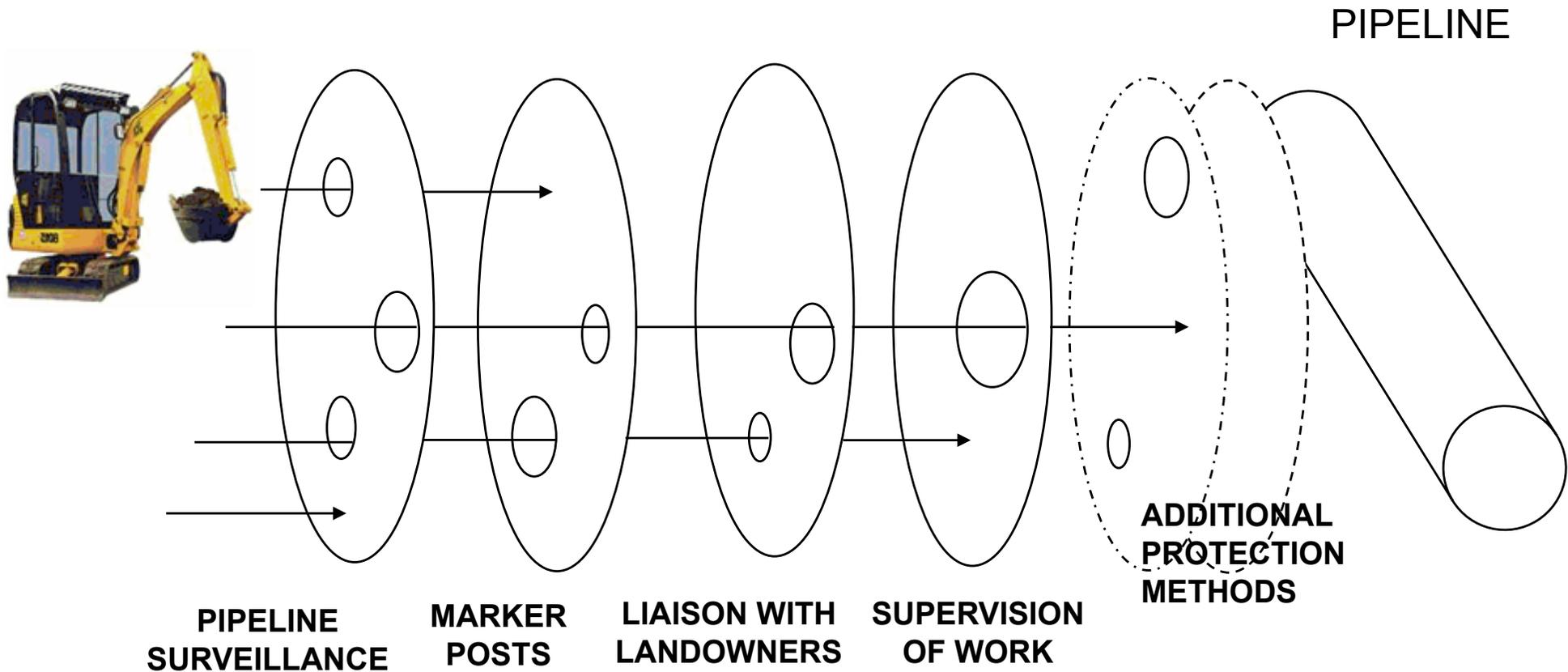
- ◆ Routing pipelines away from populated areas
- ◆ Marking of pipelines with marker posts
- ◆ Using thicker pipe in built up areas
- ◆ Providing additional protection (e.g. concrete slabs) in vulnerable areas
- ◆ Marking out of the pipeline and supervision of work
- ◆ Liaison with landowners and other key stakeholder groups
- ◆ Third party enquiry processes (including one call systems in some countries)
- ◆ Pipeline Surveillance



Pipeline protection for external interference



Pipeline protection – additional defence



What more can operators do?

- ◆ In 2006 Marcogaz carried out a survey of measures that member companies were taking to reduce the likelihood of third party interference
- ◆ This exercise identified a number of common measures that the majority of member companies were applying
- ◆ The survey also identified some additional measures that were taken by some companies

Examples of some of the additional measures that are being taken in the UK

- ◆ Collecting near miss data from helicopter surveillance flights to identify companies that are frequently carrying out work without contacting pipeline operators
- ◆ Senior management in the above companies have then been visited by our Safety Regulator in order for the companies to outline how they intend to improve their working practices.
- ◆ Stakeholder workshop - all the major companies were invited to a workshop event at which there was constructive discussion on how working practices could be improved
- ◆ Providing safety information for third parties in user friendly formats, e.g. brochures and DVDs

Marcogaz is Proposing a Benchmarking Process

- ◆ The benchmarking process will capture best practice
- ◆ It will allow pipeline operators to review their current systems and consider whether there are more steps that can be taken

Example of a Section of the Proposed Benchmarking Sheet

Management Systems				
Type of Measure	Safety Measure	Before digging starts	While Digging	When Damage Occurs
Physical	Marker Posts Signs are installed and maintained to indicate the presence of a buried pipeline and include the pipeline operators contact details	✓		
Physical	Surveillance Pipeline routes are surveyed by air, patrols on foot or by car		✓	
Managerial	Third Party Liaison Liaison with key stakeholders is undertaken regularly e.g. land owners, local authorities contractors etc. to improve awareness and relationships.	✓		
Managerial	Support of training initiatives Support provided to organisations or individuals carrying out works close to high pressure gas pipelines eg. excavator drivers	✓		
Managerial	Proactively target Frequent Offenders A traceability list of companies or organisations responsible for recurrent damages or near-misses is set-up and maintained.			✓
Managerial	Sharing Learning & Feedback Meeting Engaging other utilities and industry stakeholders to share learning and feedback about the damaging process, incidents with common learning points, emergency intervention, list of non recommended subcontractors, damage figures etc.) e.g. through workshops.			✓

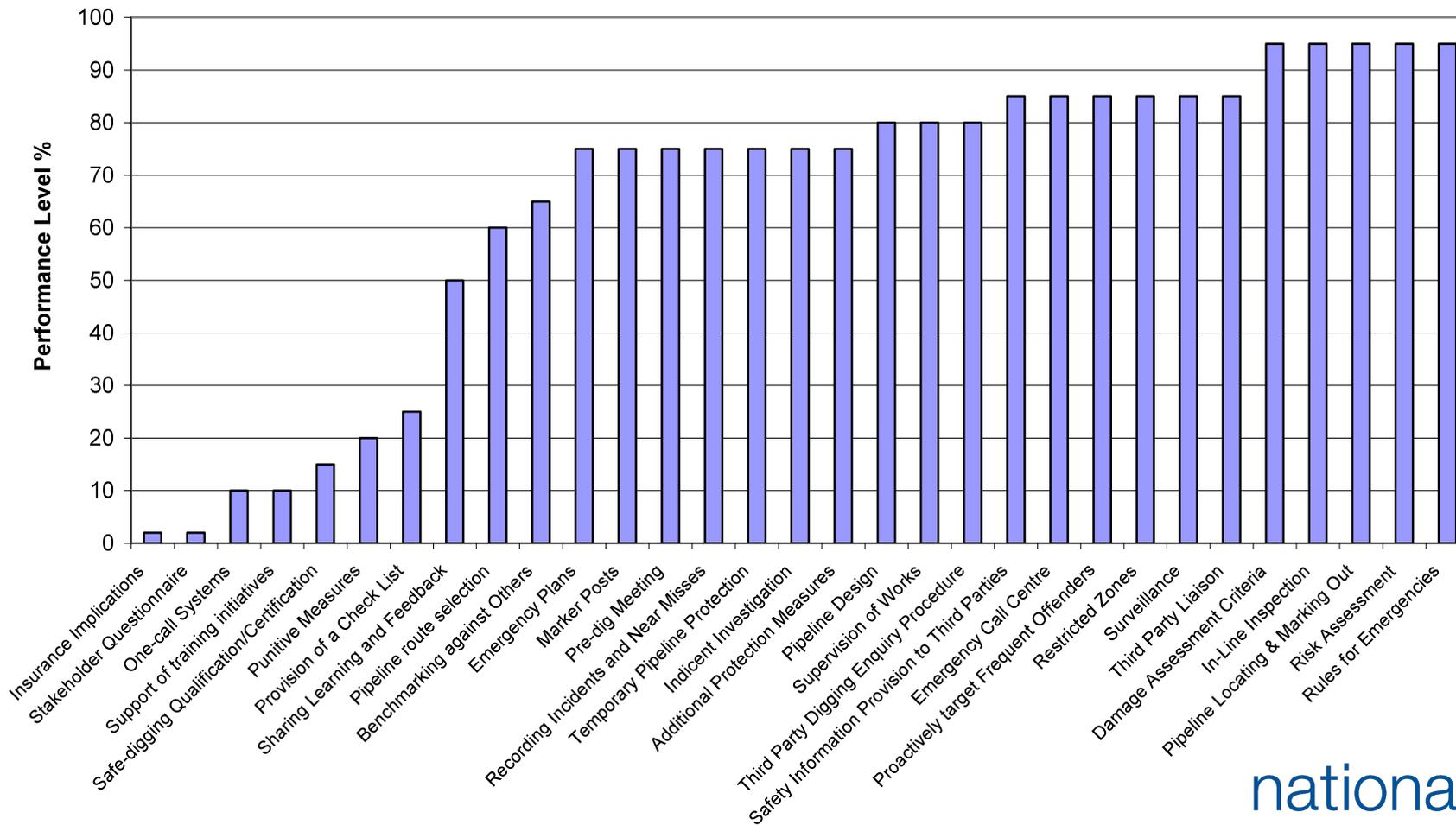
Using the Benchmarking Sheets

- ◆ Suggested that the benchmarking sheets are used internally by pipeline operators
- ◆ Pipeline operators can score themselves against the identified measures
- ◆ Example
 - No systems in place - low score
 - Systems in place but not fully implemented - medium score
 - Systems in place and fully implemented – high score

Benchmarking Process

Evaluation of Performance Level for Each Safety Measure

0-100% where 0 is lowest performance level i.e. operator currently does nothing and therefore plenty of scope for improvement and 100% is a Fully Implemented solution with no room for improvement



Not all measures may be appropriate for all companies

- ◆ There may be good reasons why some measures are not appropriate for all member companies
 - Examples:
 - Requirements of national regulations
 - Government bodies may have different responsibilities
 - Geographic differences
- ◆ Some measures may not be within the control of pipeline operators
 - Examples:
 - Control of competency requirements for individuals carrying out work
 - National one call systems

What Next?

- ◆ Marcogaz is currently finalising the benchmarking document
- ◆ Consideration will be given to whether the document should be published as a Marcogaz Technical Guidance document