

Title:
2016 Report for the UKOPA
Infringement Database

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Infringement Working Group

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1. Executive Summary

In 2016, there was an increase in the overall number of infringements reported; 907 in 2016 compared with 870 in 2015. Of these 907 report, 9 were records of A1 Malicious Damage reports on oil/fuel pipelines (compared with 32 in 2015 and 23 reports during 2014), all relating to national theft issues. These reports have not been included in any further analysis throughout this report, thus the number of infringement reports being considered is 898.

There were five A1 category (actual damage) infringement in 2016, out of 898 recorded events.

- A contractor working on behalf of a local authority uncovered a 457mm high pressure gas pipeline whilst carrying out work. Damaged was evident to the wrapping. No contact / plant enquiries had been made with the operator prior to the damage occurring.
- It is suspected that a land owner or landowner's contractor damaged a 406mm high pressure gas pipeline whilst carrying out ditching / drainage work. There was superficial damage, consisting of minor gouges and scratching to the pipeline. No contact / plant enquiries had been made with the operator prior to the damage occurring.
- A contractor working on behalf of the landowner damaged a 19 barg high pressure gas pipeline whilst carrying out earthmoving work. There was serious damage to the pipeline but no leak. No contact / plant enquiries had been made with the operator prior to the damage occurring.
- A contract working on behalf of the pipeline operator caused serious damage to equipment on a 10" Steel pipeline causing a release of gas. The operator was aware of the work taking place prior to the incident.
- A drainage contractor, whilst carrying out trenching activities to install a drainage scheme damaged a high pressure ethylene pipeline. The damage was identified during a planned in-line inspection. There was severe damaged sustained to the pipeline, that required a replacement spool to be fitted. No contact / plant enquiries had been made with the operator either prior to or after the damage had occurred.

The general increase in recorded incidents in 2016 can be accounted for mainly in the B1 and C1 categories, i.e. events that have a serious potential to cause damage to operators' pipeline and fall within the zone of interest, and is largely due to gas pipeline operators returns recorded by aerial surveys.

There continues to be no company, utility or contractor that accounts for the majority of infringements recorded; however there is one company that appears on the infringement list for the first time and will be contacted by the IWG chairman, to raise awareness of infringements and working safely near high pressure pipelines.

The greatest number of infringements again continues to occur in farmland and this will remain the biggest focus area for the UKOPA Infringement Working Group (IWG).

2. Introduction

Since 2002 UKOPA members have shared information following investigation of 'near miss' and damage incidents ('infringements') on their buried pipeline assets to ensure that:

- any information, analysis and learning from near miss incidents benefits all member companies
- the Association exploits its collective experience to establish a national data set and trends
- the pipelines industry is co-ordinated and has national coherence

The UKOPA infringement database provides a framework for recording infringements without requiring companies to adopt technically identical definitions. Whilst creating some difficulty in interpretation and analysis this has enabled the collection of data on a national pipeline industry basis. This approach has allowed the Association to develop effective improvement plans as well as ensuring its experience is fully exploited to influence and support regulatory processes.

The structure and content of the infringement database is described in the 'Guidance for Members preparing records for the UKOPA Database' which is available via the Members Centre of the UKOPA Website. A more general introduction to the database is available via www.ukopa.co.uk/excavation-safety/Introduction-to-the-UKOPA-Infringement-Database.pdf

3. Current Status and Management of Database

At the end of 2016, the following Operating companies provided a submission (including nil reports) for the UKOPA infringement database:

BP	National Grid Gas Transmission
BPA (inc part Shell)	National Grid Gas Distribution Ltd
CATS	Northern Gas Networks
CHL-PS	Petrolneos
Esso	SABIC UK Petrochemicals
Humbly Grove Energy*	SGN
IGas*	Shell Expro
Ineos	Total
Mainline Pipelines Ltd	Uniper*
	Wales & West Utilities

Those Operating companies submitting “Nil Reports” are marked *.

A number of these organisations provided their data via a single route, by means of their participation in Linewatch.

The following Operating companies, registered via Linewatch, provided no return for 2016:

Centrica
ConocoPhillips
Manchester Jetline
Marchwood Power
WINGAS UK

4. Future Plans

IWG is committed to the continued improvements of data and working to reduce the number of infringements that take place on an annual basis. To this aim, the following areas continue to be the focus for the group.

- Work to further improve the quality of the reported data

Members who do not report infringements via Linewatch will continue to work to improve the quality of the data submissions, with all members provided with a template of the information required for the UKOPA report.

As with any mass collation of data there remains a wide variety in how third parties or, in the case of contractors, “who they are working for” are named. This is also true of the “unknown” records which account for 10.5% of the overall total recorded infringements (which is a reduction from 17% in 2015). The IWG continues to engage with members to ensure that fields are completed as fully as possible.

- Review the database content to ensure that only relevant data is collected

The IWG will continue to consult with UKOPA members to ensure that the data fields within the database appropriately represent the findings from operator’s investigations of infringements. In doing so the challenge for the IWG is to ensure that there is due regard for the evolutionary nature of development of data collection by the large volume of gas contributors. These operators use large scale integrated databases which exist for purposes much wider than support of the infringement database, and so addition of new fields will be subjected to critical value and timing assessments.

- Ensure data is collected in a timely and efficient manner

Pipeline operators are requested to provide data annually. Gas operator data is subject to a review in the first quarter of each year prior to submission for inclusion in the IWG infringement report. All data is then critically reviewed for apparent errors and to ensure that appropriate data field entries are consistent with agreed standards. The Linewatch members and other authorised operators utilise the Linewatch Infringement database (LIDB) for recording all events; records are submitted via this system on a daily basis.

- Greater use of statistical techniques to reveal trends

As the infringement database continues to increase, so its statistical significance as a source of data for UK excavation safety will follow. The size of the dataset will enable the use of statistical analysis techniques to reveal trends and outputs. Critical to this will be to improve the quality of the report dataset to encourage greater consistency in terminology and reporting against all the UKOPA data fields.

5. IWG Objectives and Targets

The IWG strategy sets out a number of objectives and these are reviewed regularly to ensure that they are still relevant.

Currently, these are to:

- Engage with companies identified as the “most frequent infringers” from annual Infringement report to improve pipeline safety awareness
- Continue to collect 3rd party pipeline infringement data and publish an annual report
- Raise the profile of the Infringement Working Group in the general contractor community
- Raise awareness of working safely within cross-country pipeline easements in the general contractor community
- Improve awareness of working safely within cross-country pipeline easements with landowners and tenants
- Work with all operators, particularly gas operators, to ensure standardisation of data submitted, utilising the selection criteria already developed.

Good progress continues to be made against many of the objectives and the IWG will continue to develop on the work done to date.

UKOPA approved a number of Good Practice Guides during 2017, three of which the IWG were responsible for preparing:

- UKOPA/GP/013 Good Practice Guide Requirements for the Siting and Installation of Wind Turbines in the Vicinity of Buried Pipelines
- UKOPA/GP/014 Good Practice Guide Requirements for the siting and Installation of Solar Photovoltaic Installations in the Vicinity of Buried Pipelines
- UKOPA/GP/015 Good Practice Guide for Managing Infringements

The IWG will be preparing the following documents during 2017/18:

- Good Practice Guide for Local Authority Planners
- Landowner Guidance for Working Near High Pressure Pipelines

6. Main Findings

6.1. Infringements by Category

Figure 1 below presents the overall combined UKOPA data by infringement category. Analysis of the 2016 infringements by category shows the distribution of infringements is generally consistent with a proportional relationship between learning events, near-misses and more serious incidents (the so-called 'Heinrich's triangle').

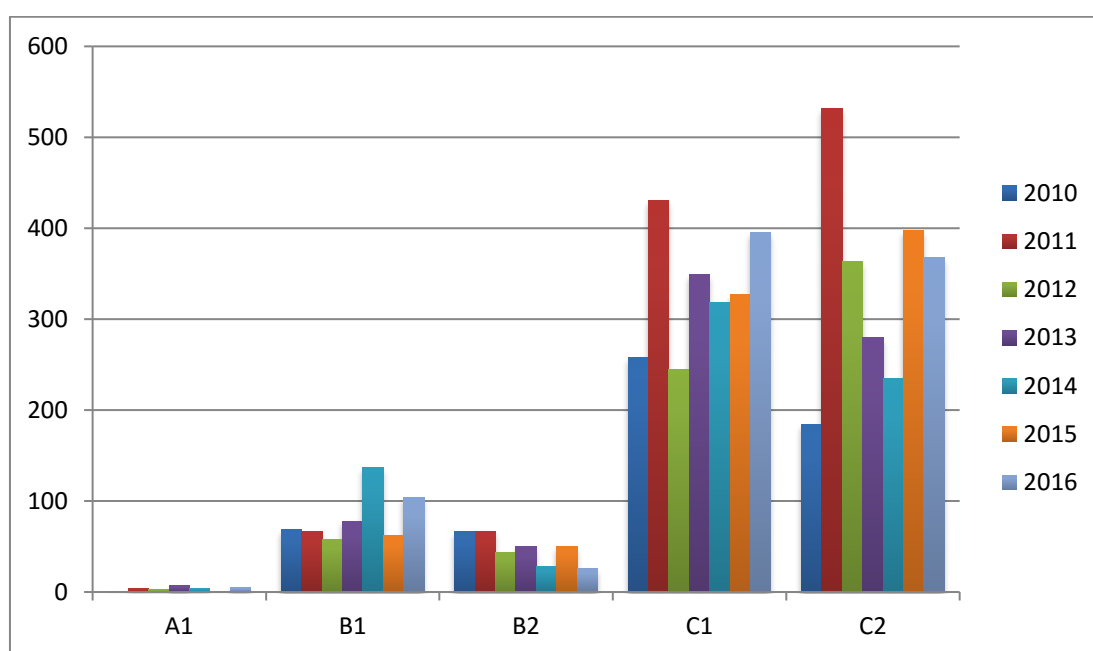


Figure 1. Infringements by Category

	2010	2011	2012	2013	2014	2015	2016	Average
A1	1	4	3	7	4	1	5	3.6
B1	69	66	58	78	137	62	104	82
B2	66	67	43	50	28	50	26	47
C1	258	430	245	349	318	327	395	332
C2	184	532	363	280	235	398	368	337
Total	578	1099	712	764	722	838	898	

Table 1: Rolling average by Category

There were five A1 category (actual damage) infringement in 2017, out of 898 recorded events.

- A contractor working on behalf of a local authority uncovered a 457mm high pressure gas pipeline whilst carrying out work. Damaged was evident to the wrapping. No contact / plant enquiries had been made with the operator prior to the damage occurring.
- It is suspected that a land owner or landowner's contractor damaged a 406mm high pressure gas pipeline whilst carrying out ditching / drainage work. There was superficial damage, consisting of minor gouges and scratching to the pipeline. No contact / plant enquiries had been made with the operator prior to the damage occurring.
- A contractor working on behalf of the landowner damaged a 19 barg high pressure gas pipeline whilst carrying out earthmoving work. There was serious damage to the pipeline but no leak. No contact / plant enquiries had been made with the operator prior to the damage occurring.
- A contract working on behalf of the pipeline operator caused serious damage to equipment on a 10" Steel pipeline causing a release of gas. The operator was aware of the work taking place prior to the incident.
- A drainage contractor, whilst carrying out trenching activities to install a drainage scheme damaged a high pressure ethylene pipeline. The damage was identified during a planned in-line inspection. There was severe damaged sustained to the pipeline, that required a replacement spool to be fitted. No contact / plant enquiries had been made with the operator either prior to or after the damage had occurred.

There were also 9 were records of A1 Malicious Damage reports on oil/fuel pipelines recorded in 2016. This a reduction from 32 in 2015 and 23 reports during 2014, all relating to national theft issues. These are not included in the above figures or in further analysis by request of the affected operators.

After the drop in B1 infringements to 62 in 2015, this figure increased by 60% in 2016 to 104; this figures being 11.5% of all the 2016 infringements. There was however almost a 50% reduction in B2 infringements recorded dropping to 26 in 2016 from 50 in 2015. The IWG continues to encourage member companies to carrying out investigation reports into these infringements and sharing the learnings throughout UKOPA.

There was a total of 394 infringements outside of the easement, but within the operators' zone of interest (B2 and C2). This represents 44% of all the infringements recorded and this is a reduction of 10% from 2015. 26 (4%) of these infringements represented a serious potential B2 threat to the pipeline – a slight decrease of 2% on the 2015 figure.

There was an increase of 20% in C1 category infringements from 327 to 395 in 2016. However, there was a 7.5% reduction in C2 category infringements from 398 to 368. Thus, there was a total of 763 category C infringements, 85% of the total number of infringement recorded.

Of the 898 infringements, 349 were recorded as the pipeline operator being aware of the activity taking place, this therefore raises the question of why these incidents occurred in the first place.

6.1.1. Infringements by Activity Type

Understanding the types of activity contributing to infringement statistics provides important information for:

- Targeting awareness training and communication
- Relating to infringement location and vulnerable areas

Figure 2 shows the distribution of infringements across reported activity types.

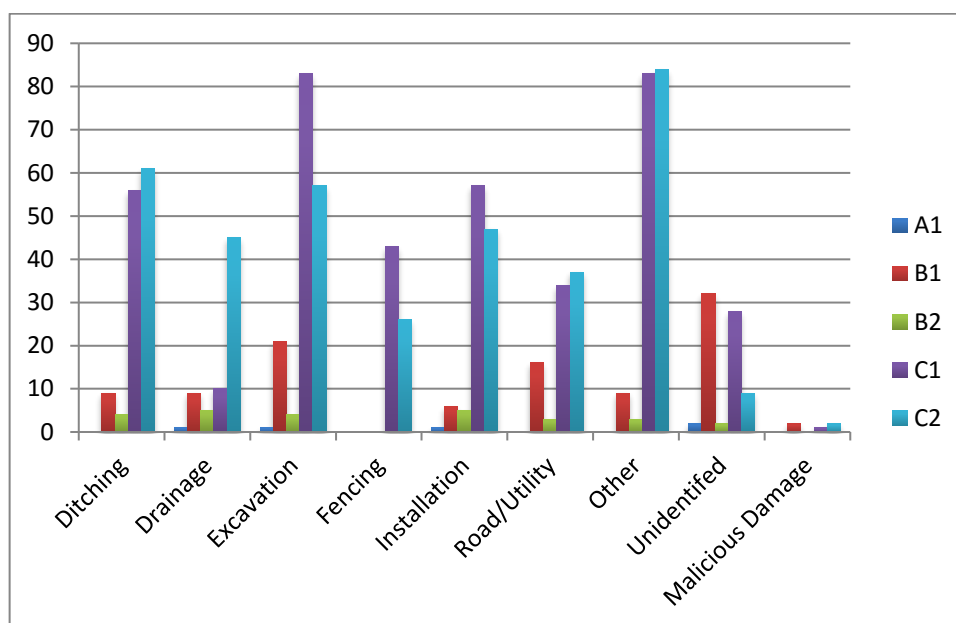


Figure 2: Infringements by Activity Type 2016

There has once again been an increase in the number of ‘unidentified’ activity type records in the 2016 figures, accounting for 8% of infringements. The IWG is determined to work with member companies during 2017 to try and redress this figure downwards.

Those activities grouped together as “other” are made up of 13 activity types – Archaeology, Crossing by Heaving Vehicles, Flooding, Forestry, Site Compound, Landscaping, Machinery Parked, Machines in Easement, Quarry, Riverbank, Tree / Vegetation Clearing, Waste Burning and Waste Dumping - which individually are low in the number of events or of limited danger.

However, there is also a specific activity type in the infringement database entitled ‘other’ and this category makes up 38% (68 incidents) of the combined ‘other’ figure (179 incidents). This is a reduction of 10% on the 2015 figure; however, work is therefore still required with regards to consistency of reporting in this field.

6.1.2. Infringements by Location

Locations where infringements take place may provide key information for:

- the main areas of pipeline vulnerability
- areas where marking is critical
- areas where excavator vigilance is particularly important

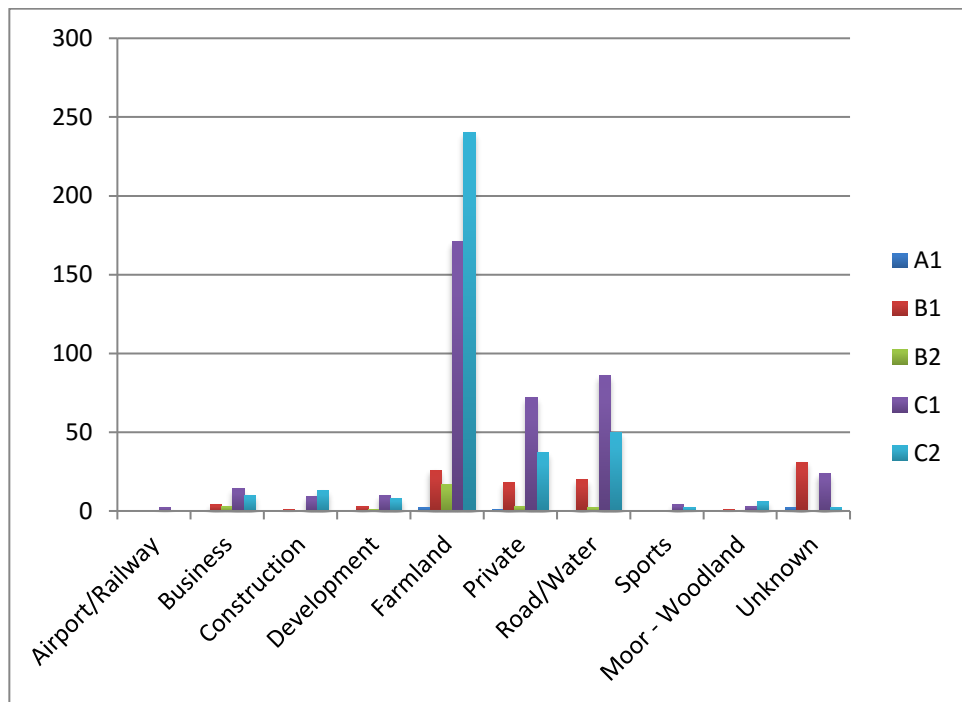


Figure 3: Infringements by Location Type 2016

Incidents in 'farmland' continues to provide the largest number of records in the database. The IWG has continued to try to engage with organisations associated with farmers – such as the National Farmers Union (NFU) and HSEs agricultural sector – to further raise awareness of the dangers of working near pipelines and the precautions required. Work has also started on an industry awareness document – working near high pressure pipelines. It is hoped that both these initiatives will lead to the same type of improvement and reduction in incidents recorded, as those associated with work carried out in roads and by utilities and contractors, that occurred following targeted action by IWG in this area in previous years.

Work in farmland, private land and roads / waterways continue to provide the greatest number of incident reports recorded, accounting for almost 83%. This figure is almost the same as in 2015. These areas therefore should remain the focus of awareness raising initiative by IWG and UKOPA member companies.

6.1.3. Infringements by Third Party Type

UKOPA is interested in which types of third parties are infringing:

- Are there any patterns?
- What does it tell us about potential weaknesses in the sub-contracting 'chain'?
- Who is responsible for checks and searches in each case?
- What does it tell us about the 'pipeline awareness' of those actually doing the digging?

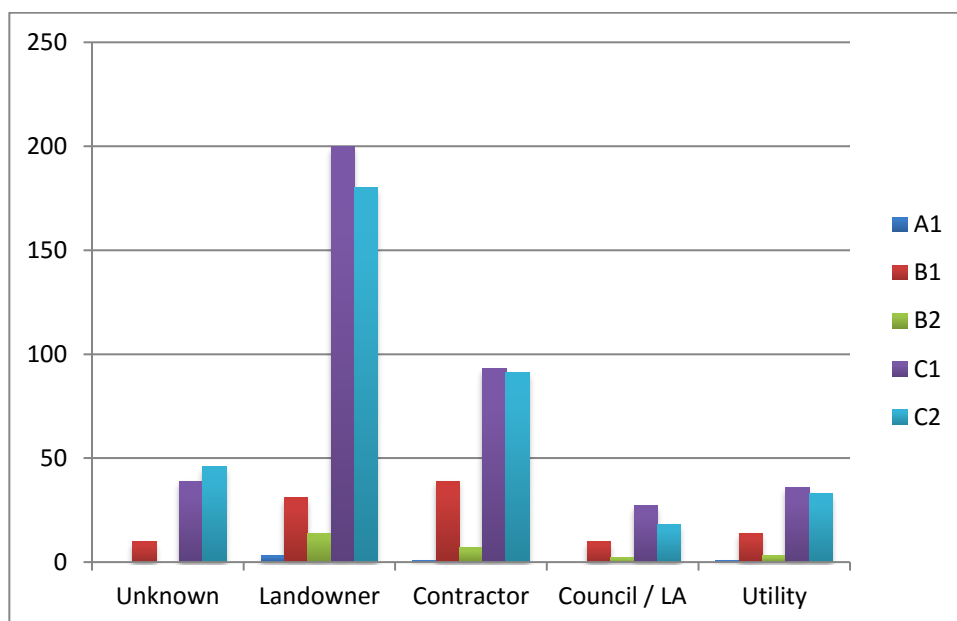


Figure 4: Infringements by Infringer Type 2016

Figure 4 describes the current position by infringer type. Landowners continue to be the largest single infringing group particularly when taking into account that Contractor figure is acknowledged to include both rural (landowner) and urban activities. It should be noted, however, that the distinction between 'Contractor' and 'Utility' can be seen as a very fine one and is masked by the significant level of contractor-delivered utility services in the UK.

In 2014 the Contractor infringer type accounted for 9.3% of all reports, in 2015 this increased to 16.6% whereas in 2016, this figure increased again to 25.7%. Following on from last year's recommendation, the IWG should look to develop an awareness campaign for UKOPA and its members to share with the contractor community to again raise awareness of the risks of working near pipelines.

The totals recorded against "unknown" (10.5% of the total number of infringements but a reduction on the 2015 figure of 17%); may suggest a lack of ability to follow-up on the original report but will inherently include parties who left the site between the sighting report and a site visit.

6.2. Third Party Infringement Performance

UKOPA are interested in identifying and working with anyone who has, or has the potential, to infringe. Those third parties who, via the database, are identified as having made multiple infringements are a particular concern, but also give a focus to where member awareness raising could be targeted.

A summary of the main activity groups are presented at the top of the Table 3 to give a flavour of the overall numbers of infringers and as an indicator of how much improvement there has been in reducing potential risk or consequence. As can be seen work still needs to be done on reducing the number of 'unknown' category reports, however, this weighted score has reduced from 221 in 2014 to 208 in 2015 down to 174 in 2016f

It should be noted that a large number of utility contractors enter into joint ventures with other companies; hence companies can carry out works in their own right or as a joint venture.

In an effort to rank repeat infringers, more "weight" is given to the raw count of infringements based on the seriousness of the infringement by applying a multiplier to each risk category, included in Table 3 as an adjacent column. The multiplier "risk" values are based upon the model developed in consultation between the IWG, Fisher German and UKOPA, as below in Table 2.

A1	10
B1	5
B2	2
C1	2
C2	1

Table 2: Risk Multiplier Matrix

UKOPA remains very aware that the infringement performance of particular companies or agencies is a very sensitive issue. Data is provided by individual operators for use in the database on the understanding that individual records are, in the first instance, confidential. Hence names of the work promoters (identified as company A, company B, etc.) in Table 3 are not published, and remain confidential to UKOPA.

However, as an invited member of UKOPA, the Health & Safety Executive (HSE) has access to the list of 'repeat infringers'. The database output in the form shown in Table 3 has been used by HSE to inform their operational strategy. There is no doubt that to date, this is the area where the database has had its greatest impact. For companies that operate on a region-by-region basis, there is some evidence to suggest that through UKOPA's activities, they have become aware of their overall infringement behaviour. HSE's feedback is that this data has received serious attention at senior levels within each company where brought to their attention.

Identifier/Category	Total	A1	Weight X10	B1	Weight X5	B2	Weight X2	C1	Weight X2	C2	Total weighted score
<i>Unknown</i>		0	0	10	50	0	0	39	78	46	174
<i>Land/Farm</i>		3	30	31	155	14	28	200	400	180	793
<i>Contractor total</i>		1	10	39	195	7	14	93	186	91	496
<i>Council / LA</i>		0	0	10	50	2	4	27	54	18	126
<i>Utility/Infrastructure</i>		1	10	14	70	3	6	36	72	33	251
Utility A	30	0	-	0	-	1	2	22	44	7	53
Company A	11	0	-	3	15	0	-	7	14	1	30
Company B	4	0	-	4	20	0	-	0	-	0	20
Company C	5	0	-	3	15	0	-	1	2	1	18
Company D	5	0	-	2	10	0	-	3	6	0	16
Utility B	4	1	10	0	-	0	-	0	-	3	13
Utility C	3	0	-	2	10	0	-	1	2	0	12
Company E	5	0	-	1	5	0	-	3	6	1	12
Company F	8	0	-	0	-	0	-	4	8	4	12
Government Agency A	5	0	-	1	5	0	-	2	4	2	11
Government Agency B	6	0	-	0	-	0	-	4	8	2	10

Table 3: Significant Infringers 2016

A further point to note regarding this data is that it currently makes no attempt to analyse numbers of infringements per third party with their national excavation activity rate. Such a measure, if it were to be developed in future, may provide an alternative expression of each third party's effectiveness in managing activities adjacent to hazardous pipelines.

As in the previous two years, the records for 2016 show a lack of infringers with multiple events (more than 10) recorded against them – just one utility company and one contracting company. Many of the contractor companies in Table 2 were sponsored by a variety of Utilities and Infrastructure agencies and generally indicate those operating at a national level and across a number of work sectors.

It is the first time that Company A has been included in the list of repeat offenders, and the IWG will consider how best to inform the company management of the impact of its activities. Where UKOPA member companies are included in the list of the highest weighted infringements scores, the IWG Chairman will make that fact known directly to the company.

As in previous years, the identities of the individual infringer companies / organisations is held by the Chairman of the Infringement Working Group.

7. Conclusions and Recommendations

In 2016, there was a 7% increase in the overall number of infringements reported; 898 in 2016 compared with 838 in 2015. The greatest increase in the B1 and C1 categories and is again largely due to gas industry returns.

The vast majority of this increase can be accounted for by one member company, a change in personnel and a change in reporting process. The IWG will try to work with this organisation to ensure that moving forward the correct mechanism is used for identifying incidents to be recorded.

In 2016, there was a 22% increase in the number of B1 and C1 findings (within the pipeline easement) compared with 2015 whereas there was an 11% reduction in the number of B2 and C2 findings (inside the pipeline operators zone of interest). Operator companies do, however, investigate all types of infringements and are encouraged to be shared the findings across the UKOPA membership.

UKOPA members, and in particular the IWG, will continue to raise awareness of working safely within pipeline easements, particularly with contractors, utilities, landowners and tenants. An emphasis on Operator companies being made aware of all planned works by landowners and/or contractors within their zone of interest should continue to be encouraged.

Members of IWG will continue to ensure that data is collected in a timely manner and engage with their members to encourage completion of all fields within the infringement database. Consistency of reporting terminology and structured approaches to reporting will continue to be developed.

The IWG will continue engage with the HSE to discuss ways of raising awareness of pipeline infringement with the farming and landowner community.

8. Acknowledgements

The development and current success of the infringement database would not have been possible without the support of UKOPA members. Their trust in providing the infringement records and the resources necessary to make the input to UKOPA should not be underestimated.

It is also important to recognise the important role played by HSE's HID Energy Division - Gas & Pipelines. They have shown faith in UKOPA's excavation safety activities, providing a valuable member of the IWG, who in turn has worked very effectively with UKOPA colleagues in pursuit of improved awareness of excavation safety in the vicinity of hazardous pipelines.

Appendix A. IWG membership 2016

From 2002 – 2004 contributions to the database were derived from chemical and oil sector pipeline operators only, but since 2005 it has also included records from the UK natural gas distribution system.

Although it has proved difficult to formally confirm the total number of oil, petrochemical and gas pipeline operators in the UK, UKOPA membership (and hence database representation) is considered to exceed 95% of operators by underground pipeline length. As a result, it provides an authoritative view on the third party threat to hazardous pipelines in the UK.

The database is managed on behalf of UKOPA incorporating input from the Linewatch Infringement reporting database where authorised member contributions are provided in a uniform format.

Activities relating to the operation of the database and development of excavation safety strategy are managed by UKOPA's Infringement Working Group (IWG), whose membership during 2016 was constituted as follows:

Colin Ballantine	Shell
Nikki Barker	IWG Secretary
Helen Berry	HSE
David Brown	Essar
Kenneth Burn	CATS
Martin Davey	SGN
Walter Gaffney	SGN
Geoff Glover	SABIC
Daniel Ingham	National Grid Gas Distribution Ltd
Jim Jarvie	Ineos
Chris Johnson	BP Exploration
Scott Law	BP Exploration
Kam Liddar	National Grid Transmission
Robert Bood	National Grid Transmission
Grant Rogers	Wales & West Utilities (IWG Chair)
Phil Rowlands	Esso Petroleum
Philip Taylor	BPA
David Turner	Northern Gas Networks

The 2016 report includes data imported from several sources of aerial surveillance databases. The gas network data has been subject to an extensive filtering exercise to retain only those events which are relevant for the infringement report. Details of the filtering process are published in the guidance to UKOPA members on the population of the infringement data by IWG. Linewatch member data is imported directly from the Linewatch database.

It is noted that the number of A1 infringements in this report may not correspond with the damage figures quoted in the UKOPA Product Loss Incidents and Fault Report (1962-2016) – UKOPA/17/003 – as the data in that report can relate to infringements from previously years that have been investigated during 2016.

Appendix B. Guidance on Infringement Categories

The UKOPA database categorises infringements on the basis of risk and location indices as follows:

Risk index can be one of three levels:

Risk Index	Infringement Type	Infringement Description
A	Pipeline Damage or Leak	Includes damage to wrap or protective sleeve
B	Serious Potential for Damage	Methods or equipment used could have resulted in significant damage had excavation taken place at pipeline
C	Limited Potential for Damage	Methods or equipment would not have resulted in serious damage

Table 4 Risk Index

Location index can be in two forms:

Location Index	Location Description
1	Within the pipeline wayleave or easement. Typically, this is the zone within which the pipeline operator has legal rights, including a requirement by the landowner to notify planned work (although may be different for non-Pipelines Act lines laid by Statutory Undertakers).
2	Within the pipeline operators zone of interest, but outside the pipeline wayleave or easement. It is the area within which the operator would have reasonably expected a competent third party to have given notification in the prevailing circumstances.

Table 5 Location Index

So that infringement categories can be summarised as follows:

	Actual Damage	Serious Potential for Damage	Limited Potential for Damage
Within Wayleave or Easement	A1	B1	C1
Within Operators Notification Zone	-	B2	C2

Table 6 Infringement Categories