

**THIRD PARTY INTERFERENCE
BEST PRACTICE SELF-ASSESSMENT**

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2. INTRODUCTION

About 50% of all incidents recorded by EGIG¹ (European Gas pipeline Incident data Group) are due to Third Party Interference (TPI). Although European Gas Operators already have a large number of safety measures or “barriers” in place to minimise the likelihood of Third Party Interference, it continues to be a major threat to buried gas pipelines. It is therefore appropriate that gas pipeline operators continue to monitor and, where possible, to improve the systems they have in place.

This document has been prepared by MARCOGAZ as a guide intended to assist pipeline companies in reviewing the system they have in place to manage the risks associated with Third Party Interference (TPI).

It comprises an inventory of practices (generally referred to as ‘safety measures’) that could be used as a self-assessment tool or as ‘internal audit’ of the prudent gas pipeline operator for further improvement of the pipeline operator’s management system to prevent TPI and more specific:

- To compare the barriers in place with the barriers that are known in the branch;
- To evaluate the potential contribution of individual barrier to the reduction of TPI incidents;
- To evaluate the barrier performance (degree or quality of implementation and execution) and to decide on possible improvements if any.

The identified practices to prevent TPI are based on:

- a) The output from a benchmarking exercise carried out by MARCOGAZ in 2006;
- b) The requirements of relevant current industry standards including the EN 1594 “*Gas infrastructure. Pipelines for maximum operating pressure over 16 bar. Functional requirements*”;
- c) The requirements of the EN 16348 “*Safety Management System (SMS) for gas transmission infrastructure and Pipeline Integrity Management System (PIMS) for transmission pipelines*”;
- d) The initiatives currently being undertaken, in addition to a), b) and c) above, by MARCOGAZ members;
- e) The by MARCOGAZ organized workshop on TPI in 2016 (October 25 and 26)

It is suggested that pipeline operators review their current practices against the identified barriers described in this document, i.e. a self-assessment tool or for an internal audit.

The review shall be carried out by developing an approach that allows the effectiveness of the barriers to be assessed in a homogeneous way and tailored to each pipeline operator.

It should be noted that not all the described ‘barriers’ may be appropriate for all the companies. There may be national requirements that may replace or negate the need for some of the

¹ www.egig.eu

requirements within this document. There may also be local national cultural or geographical reasons why some of the 'barriers' are not appropriate for individual companies. Therefore, the importance or relevance of having specific barriers to prevent Third Party Interference may vary per company.

'Barriers' can interact with each other and double counting of the benefit should be avoided.

The basic approach of the described methodology for the self-assessment can be summarized as follows.

The effectiveness of each 'barrier' to prevent Third Party Interference damage is determined for the pipeline operator company by:

- 1) The importance of each barrier: assess how significant or relevant a specific barrier is for the pipeline operator company, meaning the potential contribution in reducing the likelihood of third party induced damage;
- 2) The performance of each barrier: how well it is in place and secured?

An example of a methodology allowing companies to score themselves against each of the identified barriers is suggested in the document. The example scoring process suggested will enable companies to assess themselves:

- Whether there are any further barriers, practical for them to implement or to improve local specific situation or across the whole pipeline system;
- Whether or not the identified barriers have been implemented with satisfaction, or if there is room for improvement.

3. PROPOSED METHOD OF INTERNAL COMPANY ASSESSMENT

The following diagram describes an example of a method for the self-assessment of barriers to prevent Third Party Interference. Each steps is discussed in more detail in this chapter.

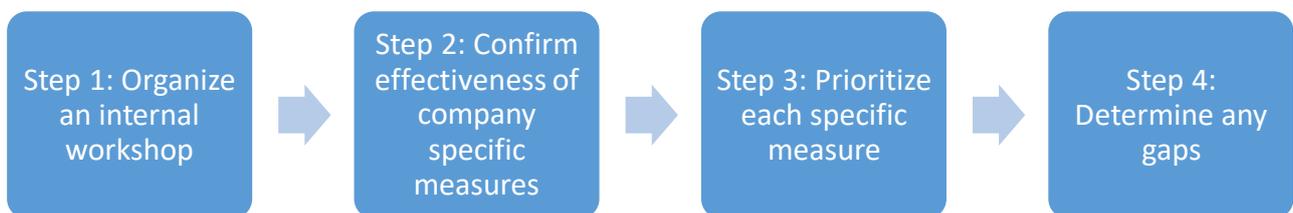


Figure 1 - Internal assessment - steps diagram

3.1. Organise a relevant internal working group for your company

Select a group of relevant individuals from the business who are sufficiently skilled and experienced to work through the barriers.

Arrange an internal workshop meeting for that group.

At the meeting, work through steps 2 to 4.

3.2. Confirm the effectiveness of the barriers for your company

This section gives an example of a scoring system that can be used by pipeline companies. The suggested system can be adapted and modified to suit the needs of individual companies. All the barriers in Appendix A have been given 'importance' and 'performance' scores. The overall effectiveness has a score from A (most important/effective barrier) till F (least important/effective barrier), see Table 2. The scores provided in Appendix A is a guidance of what could apply to the average pipeline operator. We suggest individual companies to review this effectiveness ranking and to consider whether it needs to be modified to suit with the internal and external technical, managerial, legal and environmental factors related to them.

The **effectiveness** scoring has been developed using a combination of **importance** score and a **performance** score. The importance score is first identified by deciding whether the proposed barrier has a high, moderate or low potential effect or impact using the Table 1 for guidance. It indicates the potential contribution for reduction of TPI incidents. The performance score is also identified in a similar manner, i.e. high, moderate or low again using the Table 1 for guidance. The effectiveness ranking A to F is then determined from Table 2 based on the total score which is the importance score multiplied by the performance score → **importance score * performance score = effectiveness ranking**

The importance for barriers is defined as "how much it affects the likelihood of TPI", assuming the barrier is well "in place" (well implemented and executed). For example, the importance of barriers can be scored as follows:

- 1) High effect (Score = 1): The barrier directly affects the likelihood of TPI occurring;
- 2) Moderate effect (Score = 2): The barrier has a significant effect on the likelihood of TPI occurring the effect of which can be measured;
- 3) Low effect (Score = 3): The barrier has only an indirect effect on the likelihood of TPI occurring which would be difficult to measure.

The performance for barriers is defined as "how well a company did implement specific barriers for its gas transmission system and guard the performance of the barrier". For example, the significance of barriers can be scored as follows:

- 1) High performance level (Score = 1): The barrier is assessed to have a high degree of implementation and/or is mandatory for a company to prevent the likelihood of TPI occurring - the barrier quality is secured;
- 2) Moderate performance level (Score = 2): The barrier is assessed to have a moderate degree of implementation and is not mandatory for a company to prevent the likelihood of TPI occurring;
- 3) Low performance level (Score = 3): The barrier is assessed to have a low degree of implementation, is not mandatory for a company to prevent the likelihood of TPI occurring - poor barrier quality control.

	High importance	Moderate importance	Low importance
	The barrier directly affects the likelihood of third party damage occurring (Score = 1)	The barrier has a significant effect on the likelihood of third party damage occurring the effect of which can be measured (Score = 2)	The barrier has only an indirect effect on the likelihood of third party damage occurring which would be difficult to measure (Score = 3)
High performance	The barrier is assessed to have a high degree of implementation and/or is mandatory for a company to prevent the likelihood of TPI occurring (Score = 1)	Total score importance * performance = 1 i.e. effectiveness ranking = A	Total score importance * performance = 3 i.e. effectiveness ranking = C
Moderate performance	The barrier is assessed to have a moderate degree of implementation and is not mandatory for a company to prevent the likelihood of TPI occurring (Score = 2)	Total score importance * performance = 2 i.e. effectiveness ranking = B	Total score importance * performance = 6 i.e. effectiveness ranking = E
Low performance	The barrier is assessed to have a low degree of implementation and is not mandatory for a company to prevent the likelihood of TPI occurring (Score = 3)	Total score importance * performance = 3 i.e. effectiveness ranking = C	Total score importance * performance = 9 i.e. effectiveness ranking = F

Table 1 - Determination of the effectiveness Ranking Based on the importance and performance Scores

The effectiveness ranking A to F relates to the importance and performance scores as follows:

Importance Score x Performance Score	Overall Effectiveness Ranking
1	A
2	B
3	C
4	D
6	E
9	F

Table 2 - Relationship between the Importance x Performance Score and the Effectiveness Ranking

3.3. Prioritize each barrier for your company

The effectiveness rankings are intended as a guide to support the internal discussion on barriers to prevent the likelihood of TPI occurring: i.e. a company can focus on successfully implementing barriers, ranked or prioritized based on the effectiveness score of each barrier.

The uncertainty in scoring importance and performance of a specific barrier will rely heavily on the knowledge and experience of those individuals involved in the meetings to discuss them. It is something which will be a subjective judgement that can vary from company to company and from Country to Country.

When determining an appropriate score for the performance of each barrier, it may be useful to consider the following table for demonstrating relevant scores.

Business factor	How to demonstrate
Policy	<ul style="list-style-type: none"> ✓ there is a clear policy statement that encompasses this barrier ✓ this is communicated to all employees ✓ this is communicated to contractors where required ✓ this barrier is part of the company's safety direction and general objectives ✓ it is backed by senior management commitment at the highest level
Organisation	<ul style="list-style-type: none"> ✓ a good safety organisation to ensure this barrier is employed effectively ✓ with clear responsibilities and relationships for this barrier ✓ promoting a positive safety culture ✓ and the effective implementation of safety policies ✓ and ensuring competence of staff at all levels, where required, for this barrier

Planning and implementation	<ul style="list-style-type: none"> ✓ a planned approach for this barrier ✓ with performance standards for eliminating or controlling potential hazards against this barrier ✓ The approach should be based on an assessment of the potential hazards and have clearly prioritised, time-based targets for implementation
Measuring performance	<ul style="list-style-type: none"> ✓ adequate means to measure the company safety performance for this barrier ✓ both actively, by monitoring compliance with standards (where relevant for this barrier) ✓ and reactively, by investigating the causes of accidents and incidents against this barrier
Reviewing performance	<ul style="list-style-type: none"> ✓ reviewing performance against targets for this barrier ✓ and feeding back information and experience to further develop policies and improve performance for this barrier
Auditing	<ul style="list-style-type: none"> ✓ appropriate procedures for auditing this barrier

Table 3 – Demonstration of barriers’ relevance

The above table is based on the Health and Safety Executive guidance document HS(G)65. This is an example of a Plan - Do - Check - Act Safety Management System referred to in Section 4.1 of EN 16348².

In addition, the degree of implementation and the performance level of a specific barrier will usually depend heavily on the related costs.

3.4. Determine any gaps

Once your company has decided on effectiveness scores for all relevant barriers, , for each barrier, the gaps between the actual company scores and the targeted scores should be determined..

Once the gaps are identified, it is possible to agree within the group on how the gap will be addressed i.e. what does the company need to do to get a maximum effect and thereby a maximum score for that barrier. A list of tasks to address key work can be formulated based on which barriers ranked the most important and are therefore worth spending time and effort to develop.

² EN 16348 - “Safety Management System (SMS) for gas transmission infrastructure and Pipeline Integrity Management System (PIMS) for transmission pipelines”

4. APPENDIX

4.1. APPENDIX A - matrix of barriers for the prevention of third party interference

Type of Barrier	Barrier	Importance	Performance	Overall Effectiveness
Design				
Technical & Managerial	Pipeline Design Use of appropriate design factors, material selection, depth of cover, minimum distances between other buried infrastructure etc.	1	1	A
Technical & Managerial	Additional Protection Barriers Additional protection barriers are installed in areas that are identified as being particularly vulnerable to third party interference (e.g. concrete slabs, geo-textile protection, buried warning tapes).	1	1	A
Managerial	Pipeline Route Selection The pipeline route selected takes into account areas where third party interference may be more prevalent.	1	1	A
Physical	Temporary Protection Barriers – during works Temporary protection barriers are used in certain cases of ground work around the pipeline (for example, concrete slab above the pipeline when constructing a road above the pipeline) to protect the pipeline where appropriate for example slabs (concrete or steel), construction rafts and so on when necessary.	1	2	B
Physical	Intelligent Coating New kinds of coating are in development, providing a signal when violated. No operational application known yet.	3	3	F

Type of Barrier	Barrier	Importance	Performance	Overall Effectiveness
Physical	(Fiber optic) cables routed along and or above the pipeline In case of approaching the pipeline with for instance excavation equipment, the cable will be damaged, indicating the threat to the pipeline.	3	3	F
Monitoring and routine maintenance				
Physical	Marker Posts Signs are installed and maintained to indicate the presence of a buried pipeline and include the pipeline operators contact details.	1	2	B
Physical	Surveillance Pipeline routes are surveyed by air, patrols on foot or by car.	1	2	B
Physical	Satellite Surveillance (not yet in place) As an alternative for helicopter surveillance, pilots for satellite surveillance are under construction. No operational application known yet.	3	3	F
Physical	Acoustic Monitoring Specifically, in close neighbourhood of, or at construction sites, acoustic signalling equipment can detect pipeline damage at the moment of occurrence.	3	3	F
Managerial	Third Party Liaison Liaison with key stakeholders is undertaken regularly e.g. land owners, local authorities' contractors etc. to improve awareness and relationships.	3	2	E
Preventative and corrective maintenance				
Managerial	Support of training initiatives Support provided to organisations or individuals carrying out works close to high pressure gas pipelines e.g. excavator drivers.	3	2	E
Managerial	Pre-dig Meeting Pre-digging meeting of all the stakeholders organised when necessary.	3	2	E

Type of Barrier	Barrier	Importance	Performance	Overall Effectiveness
Physical	Pipeline Locating & Marking-Out Exact identification of pipeline position using either "test digging holes" or advanced pipeline locators. Temporary marking signs installed in the digging area to mark out areas to avoid using machinery close to the pipeline.	2	2	D
Physical	Restricted Zones Restrictions for the use of any powered machinery applied in a defined area close to the vicinity of buried pipelines.	2	1	C
Physical	Supervision of Works Supervision of activities in a defined area close to high pressure gas pipelines is undertaken where necessary i.e. this would be supported by a risk assessment as appropriate. Supervision by the gas company is done regularly, sometimes unannounced.	2	1	C
Management of Emergencies				
Managerial & Physical	Emergency Plans Strategic internal intervention and emergency plans are in place dedicated to emergency situations including pipeline interference by third parties. The plan(s) is/are regularly tested with all stakeholders and amended if necessary and as required. In case of loss of containment: emergency operational procedures are initiated, taking into account, for example: depending on local circumstances evacuation and pressure reduction; collection of information on the event (location, type of pipeline, etc.); communication of first instructions (by phone) regarding "right behaviour" (no ignition sources, evacuation); information to fire brigades and on-duty staff;	3	2	E

Type of Barrier	Barrier	Importance	Performance	Overall Effectiveness
	management procedures are defined for the inspection, assessment and repair of damaged and non-leaking pipelines.			
Managerial	Emergency Call Centre – Gas Emergency Telephone Number Provision of a central gas emergency telephone number and use of the emergency call centre to effectively deal with calls to prevent the escalation of damage.	3	2	E
Communication				
Legal	Punitive Barriers Legal punitive barriers are in place to prosecute companies / individuals / organisations breaking pipeline operators' instructions.	2	2	D
Legal	Insurance Implications Arrangements are in place to ensure parties breaking pipeline operators' instructions pay all the costs caused by their illegal activity. For example, this condition could be implemented in the terms and conditions of the insurance company.	3	3	F
Managerial	Dedicated information to specific stakeholders Proactive communication to specific stakeholders like excavation machine operators, land owners, permitting agencies, supervising authorities and so on, with dedicated information regarding their roles and influence.	2	2	D
Managerial	One-call Systems A common process has been agreed between pipeline operators for third parties to call a single point of contact for a digging enquiry thus avoiding the need for the 3 rd party to separately contact several organisations.	2	1	B
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	3	3	F

Type of Barrier	Barrier	Importance	Performance	Overall Effectiveness
	intervention, list of non-recommended subcontractors, damage figures etc.) e.g. through workshops.			
Managerial	Proactively target Frequent Offenders A traceability list of companies or organisations responsible for recurrent damages or near-misses is set-up and maintained.	2	3	E
Managerial	Safe-digging Qualification/Certification A certificate and/or a qualification, demonstrating competence, is required from the contractors/subcontractors and machinery drivers/operators wishing to undertake works close to high pressure gas pipelines.	3	2	E
Safety and Environment				
Managerial	Provision of Safety Information to Third Parties Safety booklets / brochures / credit card style documents are issued to third parties on how they should approach prospective works. Safety DVD's are developed and issued to raise awareness and educate third parties.	3	2	E
Managerial	Stakeholder Questionnaire A pre-defined questionnaire is completed on third party performance to allow a rapid on-site audit of digging company behaviour and to show whether, or not, they are respecting the requirements.	3	3	F
Managerial	Rules for Emergencies Emergency rules are provided for third parties to respect when damage occurs to minimize consequences and avoid accident situations for the staff and the public.	3	3	F
Managerial	Recording Incidents and Near Misses All incidents are recorded, including unintentional release of gas, pipe damages, coating damages and near misses on the network.	3	2	E

Type of Barrier	Barrier	Importance	Performance	Overall Effectiveness
Managerial	Root cause analyses Analyse incidents and near misses to eliminate or reduce their root cause.	3	2	E
Physical & Technical	In-Line Inspection In-line inspection (pigging) of pipelines is undertaken to determine whether there is damage to pipelines. The damage may have gone unnoticed through routine patrols e.g. aerial or car/walking surveillance. Note: generally, pipelines are only in-line inspected relatively infrequently. This should therefore not be considered to be a primary protection barrier.	2	3	E
Physical & Technical	Leak detection (for example CHARM³) Air surveillance of third party activities can be extended by gas detection equipment, making it possible to detect pipeline damage causing loss of containment.	2	3	E
Benchmarking				
Physical	Provision of a Check List A check list is defined to verify that all the usual basic practices are respected (feedback shows that damages often occur when a deviation to those basic practices is observed).	3	3	F
Managerial	Benchmarking against Others Benchmarking is undertaken, of internal barriers, and compared against other companies/organisations and learning shared.	3	3	F
Managerial	Recording fault and/or failure data Fault and or failure data is collected and analysed to identify trends and compare with other operators, action is taken where degradation of controls are identified	3	2	E

³ CHARM: CH₄ Airborne Remote Monitoring system