

Good Practice Guide

Guidance on the issues to be considered by Promoters, Designers and Planners of new developments in the vicinity of high pressure pipelines

UKOPA/GPG/042 Edition 1

July 2023

GUIDANCE ISSUED BY UKOPA:

The guidance in this document represents what is considered by UKOPA to represent current UK pipeline industry good practice within the defined scope of the document. All requirements should be considered guidance and should not be considered obligatory against the judgement of the Pipeline Owner/Operator. Where new and better techniques are developed and proved, they should be adopted without waiting for modifications to the guidance in this document.

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Revision and change control history

Planned revision: 2024

Edition	Date	No. of pages	Summary of changes
1	July 2023	9	First Issue

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1. INTRODUCTION

1.1 Background

This document has been prepared to provide guidance to Promoters, Planners and Designers of new developments within the vicinity of high pressure (HP) pipelines on the issues that should be considered to ensure the integrity and safe operation of these assets.

The document is also intended to provide pipeline operators with guidance on the factors that need to be addressed when new developments are proposed. These include construction related issues, possible modifications to pipeline systems, electrical interference on pipelines, undertaking pre-construction surveys and an assessment of future operation and maintenance requirements as a result of any new developments.

Pipeline operators may require Promoters of new developments to implement risk reduction measures to pipeline systems from any new development. This may include measures to be taken to ensure personnel working on a buried pipeline system are not exposed to enhanced safety risks as a result of any new development.

Guidance on actions to be undertaken in specific situations is provided in the documents referenced in Section 6. This document is not intended to provide detailed guidance on how impacts on a pipeline system are assessed but it is intended to highlight the fact that it is in the interests of the Promoter that the pipeline related issues are considered at as early a stage as possible. This document is in addition to the guidance given in UKOPA/GP/029 [1] and will assist Developers and Promoters of new works the nature of the assessments that should be conducted. Time delays and costs may be incurred due to the nature of additional works required in close proximity to the pipeline.

1.2 Scope

The guidance in this document is applicable to all steel pipelines operated by UKOPA members and provides information on good practice for construction and maintenance. This document provides only an outline of the information that should be considered by Promoters, Planners and Designers of new developments. This is to ensure all risks to the general public, operational personnel and pipeline systems during construction and operation of a pipeline system are effectively managed. This applies to both new and existing pipelines.

Every effort has been made in the preparation of this document to identify relevant risks. However, some risks may not be included, and it is the duty of Promoters of the new works and pipeline operators to carry out their own assessment of situations that may lead to risk and implement appropriate mitigation methods.

1.3 Application

The document is considered by UKOPA to represent current UK pipeline industry good practice within the defined scope of the document. All requirements should be considered to be guidance and should not be considered to be obligatory against the judgement of the pipeline Owner/Operator. Where new and better techniques are developed, they should be adopted without waiting for modifications to the guidance in this document.

Within this document: **Shall:** indicates a mandatory requirement

Should: indicates good practice and is the preferred option

2. NATURE OF NEW DEVELOPMENT

The nature of the developments, which can impact on buried pipelines include major National Infrastructure projects such as the construction of new overhead and buried cable systems both HVAC and HVDC plus new road and rail construction projects, which may even necessitate pipeline diversions and modifications to pipeline CP systems.

Modifications to existing cable systems e.g. uprating requirements, increasing the operating load capacity on existing power cable systems or available fault currents, removal of overhead power cables and replacing these with buried cables for Visual Improvement Projects (VIP) can create pipeline integrity and safety risks.

The installation of mobile telecommunications equipment close to above ground installations associated with a pipeline system can also create safety risks due electromagnetic induction.

Construction of new electrical energy facilities e.g. substations, power generation facilities, small and large scale diesel and waste energy plants, HVDC/ HVAC converter stations, new Battery Energy Storage Systems (BESS) and solar farms can create electrical interference risks.

The impact of new Onshore windfarm projects or modifications to existing onshore windfarm installations on buried pipelines should also be considered.

Housing developments within the vicinity of buried pipelines can create issues in relation to building proximity distances, construction of permanent and temporary infrastructure within the vicinity pipelines and also the operational maintenance on pipelines. Developments could also impact upon ground stability and thus the loading stress exerted on the pipeline.

Any new project within 1000m of a buried a pipeline may impact on a pipeline's integrity and its safe operation, and engagement with the pipeline operator is required at an early stage.

3. TIMESCALES AND COSTS

3.1 General

Numerous issues can be created by new developments within the vicinity of existing above ground and buried pipelines, and Promoters of any new works should consider these at the early stages of any proposed development.

The presence of buried pipelines can have a significant effect on the costs of any new development and its route or location. The impact that the presence of a pipeline may have on a project should be taken into account as soon as possible and certainly as part of any initial planning or feasibility study and conceptual design.

In certain instances, diversions to pipeline systems may be required to facilitate the construction of the new development and if a pipeline diversion is necessary, it may take a number of years to organise and arrange diversions.

In certain instances a pipeline diversion may not be practical or possible and if this is the case then the Promoter of the new works needs to identify this at an early stage as the new development may not be feasible.

3.2 Pipeline Operator Engagement

Early engagement with pipeline operators is essential and should be undertaken ideally at the conceptual planning stage.

This will enable an assessment to be made of any modifications that may be required to a pipeline system to ensure its continued safe operation. The impacts that the presence of an existing pipeline may have on any new project should be considered in conjunction with any environmental, ecological and feasibility assessments.

Modifications to pipeline systems may be minor e.g. alterations to a pipeline cathodic protection (CP) system to a major diversion and replacement of pipeline sections.

Pipeline operators can assist Promoters in identifying the nature of the effects on pipeline systems but do need to be provided with all relevant information in a timely manner. This will enable the pipeline operator to assess the risks to the pipeline, its staff and also those to the general public.

3.3 Project Costs

The Promoter of any new works should budget for costs that the pipeline operator may incur as a result of any new development and may then impose on the Promoter. These may include pipeline inspection supervision costs to oversee work within a pipeline wayleave, pipeline operator management time, costs for specialised consultancy services in relation to new developments e.g. design of impact protection, modifications to pipeline systems, electrical interference modelling studies and modifications to pipeline CP systems.

In certain instances, diversions to pipeline systems may be required and these may take time to organise and arrange specialist Designers would need to be employed to carry out modifications to HP pipeline systems.

Dependent upon the nature of the modifications to pipeline systems the additional costs can be significant.

3.4 Management of Change Procedures

Operators of Major Accident Hazard Pipelines (MAHP) have Management of Change (MoC) procedures that cover modifications to pipeline systems. The MoC procedures are specified in the pipeline design code and can take time to complete.

Pipeline diversion designs, modifications to pipeline depth of cover or CP systems, the construction of temporary and permanent crossings of pipelines are typical situations where MoC procedures would need to be followed. The implementation of MoC procedures can create an additional delay to a project timescale, which the Promoter and Developer of the new works would need to factor in when determining their overall project timescale.

4. ISSUES ON PIPELINES

The issues that Promoters of new developments and pipeline operators would need to consider include but may not be limited to.

- a) Pipeline hazard distances from new developments.
- b) Infringements of pipeline design codes in terms of building proximity distances, depth of cover and pipeline route classification.
- c) Whether the classification of any road or rail systems would change from minor to major as a result of any new development.
- d) Construction of either permanent and/or temporary crossings of pipelines, which may impose additional loads on a pipeline.
- e) Piling, auguring and explosive detonation in proximity to pipelines.
- f) Construction of, or modifications to, electrical power cable systems within the vicinity of a pipeline.
- g) The impact of new onshore windfarms in terms of separation distance and electrical interference.
- h) Construction of new photovoltaic (PV) installations and possible DC stray current interference risks on buried pipelines.
- i) Installation of electrical substations and pylons in proximity to pipelines and any enhanced touch and step potential risk.
- j) The AC corrosion risk on pipelines due to low frequency induction from new cable systems or increasing the loads on existing cable systems.
- k) Electromagnetic interference from the construction of mobile telecommunications equipment in close proximity to AGIs.
- l) Modifications to pipeline CP systems to mitigate AC and DC electrical interference risks or provide enhanced corrosion and integrity capability.
- m) The location of CP ground beds within the vicinity of the pipeline.
- n) Pipeline coating integrity surveys pre and post construction and the ability to conduct over the line (walking) surveys.

Dependent upon the nature of the development other issues may also be identified, which may need to be addressed.

Promoters should establish the relevant standards and codes of practice to be followed for design and construction related activities as these are often different to those that the Promoters Designers would normally be familiar with and should be agreed with the pipeline operator in advance of the work.

5. LEGISLATIVE REQUIREMENTS

In addition to the general duties in place in the Health and Safety at Work Etc. Act 1974 [2], the Construction, Design and Management (CDM) Regulations [3] the Principal Designer is required to plan, manage and co-ordinate the design work to ensure that the installation can be built safely.

The Principal Designer is also required to produce and maintain a health and safety file, which must include information related to the management of health and safety risks during any future maintenance, repair, construction work or demolition work.

The specific design related risks to pipelines shall be considered and identified, risk mitigation measures where necessary implemented and residual risks identified.

For work in the vicinity of a HP pipeline, the health and safety file must also recognise the potential hazards associated with the pipeline. In addition to the CDM Regulations, there are also a number of Regulations that are relevant to construction work in the vicinity of buried pipelines.

These include Regulation 15 of the Pipelines Safety Regulations 1996 (PSR) [4], which specifies that *'no person shall cause such damage to a pipeline as may give rise to danger to persons'*.

A part of any new development the Promoter may need to enter into legal agreements with the pipeline operator to provide construction indemnities, rights of access for repair and maintenance, modifications to existing wayleave agreements and cable crossing agreements,

6. SUPPORTING DOCUMENTS

UKOPA document are available to provide additional guidance:

UKOPA/GP/029 [1]	Guide for Local Authority Planners information regarding on shore pipelines and associated installations
UKOPA/GP/013 [5]	Provides information in relation to the siting and Installation of wind turbines installations
UKOPA/GP/014 [6]	Provides guidance in relation to the sitting of PV farms in the vicinity of pipelines
UKOPA/GP/016 [7]	Hazard distances guidance
UKOPA/GPG/027 [8]	AC corrosion guidelines
UKOPA/GPG/031 [9]	DC stray current interference guidelines
IGEM/TD/1 [10] PD-8010-1 [11]	Pipeline design codes provide addition information
HSG 47 [12]	Also applies to work in the vicinity of buried pipelines

7. REFERENCES

- [1] UKOPA, *UKOPA/GP/029 Edition 1, Local Authority Planners information regarding On Shore Pipelines and Associated Installations*, UKOPA, January 2019.
- [2] HMGov, "Health and Safety at Work etc. Act 1974 c. 37," HMGov, London, 1974.
- [3] HMGov, *The Construction (Design and Management) Regulations 2015, No. 51*, HMGov, 2015.
- [4] HMGov, "Pipelines Safety Regulations 1996, Statutory Instrument 1996. No. 825," HMGov, 1996.
- [5] UKOPA, *UKOPA/GP/013 Edition 1, Requirements for the Siting and Installation of Wind Turbines Installations in the Vicinity of Buried Pipelines*, UKOPA, 2017.
- [6] UKOPA, *UKOPA/GP/014 Edition 1, Requirements for the Siting and Installation of Solar Photovoltaic (PV) Installations in the Vicinity of Buried Pipelines*, UKOPA, 2017.
- [7] UKOPA, *UKOPA/GPG/016 Edition 1 Good Practice Guide Pipeline Hazard Distances*, Ambergate: UK Onshore Pipeline Operators' Association, 2017.
- [8] UKOPA, "UKOPA/GPG/027 AC Corrosion on Pipelines," United Kingdom Onshore Pipeline Operators' Association, 2019.
- [9] UKOPA, "UKOPA/GPG/031 DC Interference Guidelines," United Kingdom Onshore Pipeline Operators' Association, 2020.
- [10] IGEM, "IGEM/TD/1 Edition 6, Communication 1848, Steel Pipelines for High-Pressure Gas Transmission," Institution of Gas Engineers and Managers, Kegworth, 2021.
- [11] "PD 8010-1:2015+A1:2016 Pipeline systems – Part 1: Steel pipelines on land – Code of practice," BSI Standards Publication, 2016.
- [12] HSE, *HSG47, Avoiding danger from underground services*, 3 ed., HSE, 2014.