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Guidance on Practice for Selection of the Design Basis for Pipelines

GP 43-07

**BP GROUP
ENGINEERING TECHNICAL PRACTICES**

Foreword

This is the first issue of BP Engineering Technical Practice (ETP) BP GP 43-07. This is not a standalone document; it shall be used in accordance with the requirements of ETP document PR 43 series. In addition to the requirements for this document, those of relevant BP group standards such as getting HSE right policy (gHSEr), Process Safety/Integrity Management standard (PS/IM) and the Major Projects Common Process (MPCP) shall also be fulfilled.

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Introduction

This ETP provides an overview of the issues to be considered when selecting the parameters that will govern the design, construction, and operation of the pipeline. This document is applicable to both onshore and offshore pipelines. This document shall be used in conjunction with other GP documents to fully determine the complete requirements. This document will result in the first issue of the Statement of Requirements (SoR) and Basis of Design (BoD) during the Appraise stage of the project.

This GP should be applied by the SPU leadership, including project management, when planning the content of the SoR and BoD.

The SoR should define the overall SPU requirements or objectives specific to the design (e.g. flowrate, fluid type, start/end points), whilst the BoD should also include other broader design requirements (e.g. the necessary facilities, ambient design conditions). Both documents should be updated as the design develops, from Appraise to Execute.

GPs 43-09, 43-20, 43-21 and GIS 43-211 provide the more detailed design guidance after this document.



1. Scope

This document describes the issues to be considered when developing the BoD for a pipeline system. The specification of the system capacity is described, together with the key influences on the capital cost. The specification of operating pressure, and its interaction with the type of fluid being transported is discussed herein, as is the interaction of operating pressure with diameter, material specification, and the station requirements. Comment is also given on the selection of an appropriate design code.

The principal aim of the Pipeline ETP document set is to give appropriate guidance and direction for metal pipelines. There may be some instances in which non-metallic pipe is used. The direction in document GP 43-00 is just as applicable to non-metallic pipe. However, specific design details for non-metallic pipe are not included in the wider document set.

2. Normative references

None.

3. The Basis of Design document

3.1. Contents

- a. The Basis of Design (BoD) document shall specify the key design requirements and operating conditions for the pipeline system.
- b. The information therein shall be used to determine the:
 1. Pipe diameter.
 2. Material.
 3. Pipe wall thickness.
 4. Pipeline routing.
 5. Operability.

This document is intended to ensure that projects achieve an appropriate level of flexibility of capacity designed into their system and that the key issues affecting the design basis are raised early in the life of the project.

- c. The following issues shall be considered in the BoD document:
 1. Scope (e.g. from the head pump/compressor station, via intermediate pump/compressor stations, to the delivery terminal).
 2. Basic geographic criteria (e.g. pipeline start and finish location/coordinates, reference elevation for pressures above mean sea level, any routing constraints, burial requirements).
 3. The nature of the fluid to be transported (e.g. crude oil or other hydrocarbon liquids at stock tank conditions; high vapour pressure liquids; gas; rich gas; dense phase; multiphase), the pressure/temperature conditions required to keep the fluid in this condition through the pipeline system, and the fluid characteristics (e.g. wax, H₂S and CO₂ content).
 4. Required flow rates over time (e.g. hourly, daily, seasonal, annual, and year by year variations; need for expansion) and any requirement for a phased development to suit the build up of the flow rate. Clarification of the peak hydraulic versus annual average flow rate requirements.

