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Guidance on Practice for Pipeline Decommissioning and Removal from Service

GP 43-57

**BP GROUP
ENGINEERING TECHNICAL PRACTICES**

Foreword

This is the first issue of Engineering Technical Practice (ETP) BP GP 43-57. This Guidance on Practice (GP) is newly created and is not based on heritage documents from the merged BP companies.

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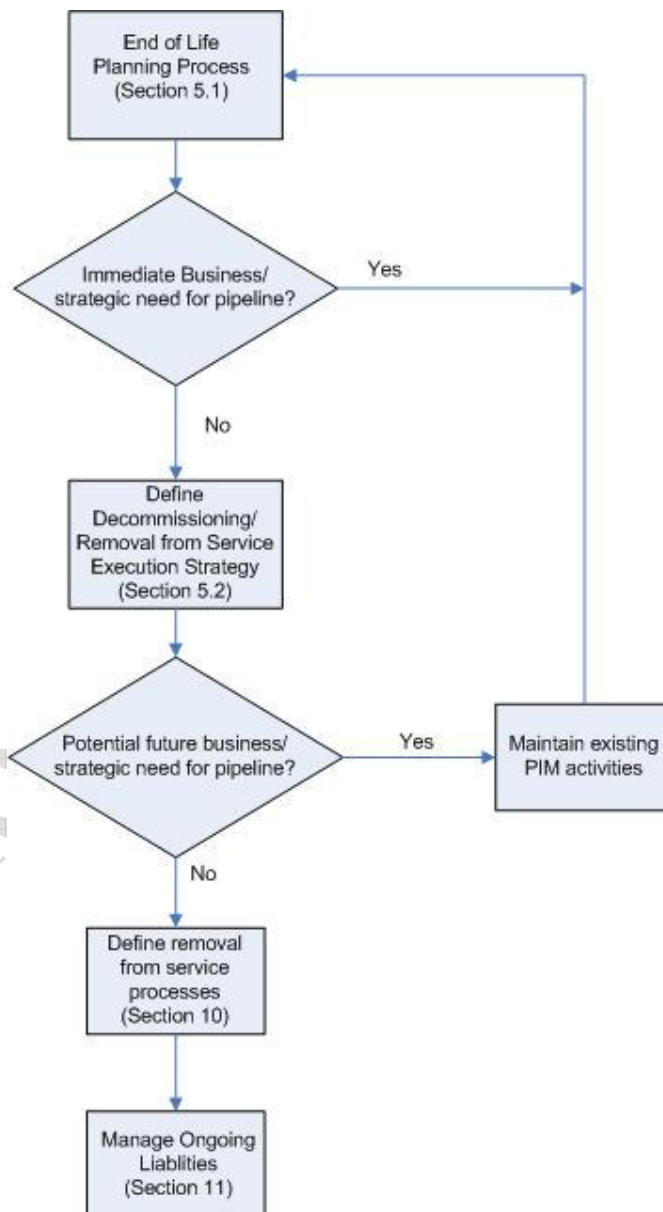
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Introduction

This document is intended to give guidance to those considering the decommissioning of, and/or the subsequent removal from service of onshore cross country or offshore pipelines. The processes described follow the structure given in Figure 1.

Figure 1 - Decommissioning processes



1. Scope

The primary focus of this document is onshore and offshore subsea hydrocarbon and water injection pipelines constructed from welded carbon steels, but most of the guidance is applicable to other process fluids or pipeline materials.

It provides an overview of the key issues to be considered in addressing decommissioning or removal from service of pipelines and further details the range of technical, operational, regulatory, and other matters to be addressed as well as areas of ongoing effort, cost, and liability.

In the context of this document decommissioning covers the planning, engineering, and risk management activities required to establish and maintain a suitable pipeline condition to allow safe execution of post decommissioning activities such as repair, temporary suspension of operation, or removal from service with minimum environmental impact.

Removal from service activities described in the document cover the measures applied after decommissioning to minimise risks, environmental impacts, and the ongoing liabilities to BP when the pipeline is no longer required for service.

In recognition of the global and trans-national nature of BP's business and asset holdings, this document tries to avoid a wholly prescriptive approach that might introduce unnecessary constraints that are location specific or may conflict with local regulatory requirements.

The regulatory requirements in the country in which the pipeline is situated may define the standards that apply to that pipeline.

2. Normative references

The following normative documents contain requirements that, through reference in this text, constitute requirements of this technical practice. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this technical practice are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies.

BP

GP 43-00	Guidance on Practice for Pipeline Systems (Overview Document).
GP 43-05	Guidance on Practice for ESIA for Pipelines.
GP 43-06	Guidance on Practice for Responsibilities of a Pipeline Operator.
GP 43-24	Guidance on Practice for GIS and Mapping for Pipelines.
GP 43-29	Guidance on Practice for Land Acquisition for Pipelines.
GP 43-49	Guidance on Practice for Pipeline Integrity Management Systems.
GP 43-50	Guidance on Practice for Pipeline Pigging.
GP 43-56	Guidance on Practice for Pipeline Assessment, Rehabilitation, and Change of Use.



American Society of Mechanical Engineers (ASME)

ASME B31.4	Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids.
ASME 31.8	Gas Transmission and Piping Systems.
API Spec 5L	Specification for Line Pipe.

3. Terms and definitions**Pipeline**

Pipeline refers primarily to an enclosed pipe system that extends between two or more process facilities (e.g. offshore platforms, pumping/ compressor station, tank farm/ storage facility, refinery, etc.) with the objective of conveying bulk volumes of fluid or fluids between those process facilities. A more comprehensive definition is given in GP 43-00. The pipeline typically conforms to all or part of the scope of coverage of ASME B31.4 or ASME B31.8.

Decommissioning

Decommissioning of a pipeline refers to the process of disconnecting a pipeline from all sources of process fluid, removing process fluid from the pipeline, and leaving the pipeline in a safe state for potential repair, intervention, future re-commissioning, or permanent removal from service.

Removal from service

The practice following decommissioning to permanently remove the pipeline from operation and leave the pipeline in an appropriate condition such that it presents no adverse safety or environmental concerns and does not interfere with future activities on or around the pipeline ROW.

4. Symbols and abbreviations

For the purpose of this GP, the following symbols and abbreviations apply:

AC	Alternating Current
CIPS	Close Interval Potential Survey – measurement of pipe to soil potential with a reference cell at regular close intervals along the pipeline to determine the coating integrity
CP	Cathodic Protection – application of galvanic device or process to change the electropotential of the pipeline relative to the ground in which it is laid to prevent corrosion
DCGV	Direct Current Ground Voltage – measurement of cathodic protection current leakage to earth (ground)
ESD	Emergency Shut Down – process of shutting down the pipeline or process in a short a time as is safely possible in the event of an emergency
HAZ	Heat Affected Zone – parent material immediately to either side of a weld that has been heated to elevated temperatures during the welding process and is likely to have modified



mechanical properties as a result, the extent of which change is dependant on pre and post weld heating and cooling rates

HIPPS	High Integrity Pipeline Protection System – system with high levels of redundancy of critical instrumentation and protective devices to prevent or contain process conditions that may threaten the pipeline integrity
ILI	In Line Inspection – inspection of the pipeline by running an intelligence gathering inspection tool (often called “smart pig”) through the pipeline – usually in the conveyed fluid with minimum or no disruption to the pipeline operation
MAOP	Maximum Allowable Operating Pressure – maximum pressure that the pipeline is designated as being allowed to operate. Usually lower than the design pressure to allow for predicted transient overpressures to remain within the design pressure.
MOC	Management of Change – change control management procedure to capture, review, authorise, and document changes
MPI	Magnetic Particle Inspection – method of NDT used to detect surface and subsurface defects in ferro-magnetic materials
NDT	Non Destructive Testing – inspection and testing of materials without damaging them or rendering them unserviceable
PTO	Permit to Operate – permission from the regulatory authorities to operate the pipeline following satisfactory verification of fitness for purpose of the pipeline design and construction and due diligence of the pipeline operations management system
ROW	Right of Way – corridor of land in which the pipeline is installed. May or may not be owned by the pipeline owner, but legal right of way for the pipeline is conferred by the appropriate authority.
SMYS	Specified Minimum Yield Stress –minimum stress specified at which the pipe material plastically yields.

5. Planning for decommissioning and removal from service

5.1. End of life planning

- a. For new pipeline projects, end of life planning shall form part of the project definition phase from CVP Select stage with constraints, assumptions, and provisions for future decommissioning and removal from service being documented.

Decommissioning of pipelines represents a non-routine operation with significant potential hazards to BP staff and third parties. Decommissioning also presents significant environments and reputational risks that need to be fully understood and addressed.

- b. For existing pipelines, end of life provisions shall form part of the pipeline integrity management system with periodic review of forecast end of commercially viable operation



based on forecast production or throughput demands and predicted remnant life at required levels of structural integrity.

- c. The end of life planning process shall address appropriate financial provisions for anticipated decommissioning costs.

In some regulatory regimes the regulator seeks evidence to verify that the asset owner has made adequate financial provision for future decommissioning and removal from service of the pipeline. He may also seek evidence that these financial provisions are maintained by the new owner in the event of transfer of asset ownership.

- d. The end of life planning process shall consider the developing regulatory and legal framework which applies to the pipeline.

Relatively few pipelines have so far reached the end of their working life and hence regulatory provisions for their decommissioning and removal from service are not generally well developed. However, with the increasing number of production facilities reaching depletion, increasing proportion of pipelines reaching end of original design life, and increased public awareness of environmental matters, the focus of regulators and the public on the impact of pipeline decommissioning is steadily increasing.

- e. The end of life planning process shall recognise that it may take several years of negotiation with regulators, partners, or other affected or interested parties (e.g. fishing lobby, NGOs, adjacent operators, etc) to reach a mutually acceptable decommissioning process.

This is particularly the case if there is a relatively underdeveloped regulatory regime or limited local precedents for local facility decommissioning.

- f. Consultation and communication processes shall be defined as part of the end of life planning process.

These consultation and communications processes may include contact with regulators, print and broadcast media, operators of adjacent assets, NGOs, landowners/ occupiers, fisherman, partners, etc.

- g. The end of life planning process shall ensure that an appropriate risk assessment and cost benefit analysis of decommissioning plans is included in the early stages of CVP Define stage.

- h. The end of life planning process shall ensure that, if appropriate, the pipeline decommissioning and removal from service process forms part of an integrated plan with adjacent assets and does not compromise or is not compromised by the end of life requirements of adjacent structures or facilities.

For example, whilst removal of jackets and topsides may represent the optimum balance of cost, safety, and environmental performance, this may not be the case for buried, large diameter, long distance sub-sea pipelines in significant water depths. It is therefore important to ensure that pipeline decommissioning and removal from service is specifically addressed as part of the overall end of life planning for an asset.



- i. The definition of the extent of the pipeline may also influence the preferred option and shall therefore be considered in the context of adjacent assets when selecting the decommissioning or removal from service options.

For example, although a sub-sea riser or above ground feeder pipeline may form part of the operating pipeline asset, it may be more appropriate to consider it as part of the adjacent platform/ processing facility for the purposes of the decommissioning planning process.

5.2. Execution strategy

5.2.1. General

- a. If it has been identified that a pipeline is required to be decommissioned or removed from service, an Execution Strategy shall be prepared which documents:
 1. Definition of the assets to which the decommissioning or removal from service process applies. Asset definition shall include any additional facilities or structures associated with the pipeline such as control cables (copper and fibre optic), power cables, umbilicals, buildings, protective slabs, etc. which may also present an ongoing hazard or liability.
 2. Reasons for decommissioning or removal from service.

Typical reasons for decommissioning or removal from service may include:

 - *The pipeline integrity is no longer adequate for safe operation or uneconomic to repair – corroded, damaged, etc.*
 - *Uneconomic to operate – alternate transportation route/method available.*
 - *Decline of market requirement.*
 - *No immediate use – closure of ingress or egress terminal/location, depletion of production facility.*
 - *Temporary - to carry out engineering works/repair, etc.*
 3. Assessment of technical feasibility of options available for decommissioning and removal from service.
 4. Assessment of environmental and safety impacts for each option.
 5. Assessment of costs for decommissioning and removal from service including any ongoing maintenance or other costs.
 6. Analysis of current and future regulatory or other constraints.
 7. Recommendation of the most appropriate option.
- b. Definition of the Execution Strategy and subsequent implementation shall follow the group Capital Value Process (CVP) and be subject to normal project management controls.

Preparation of such an Execution Strategy document may also be a regulatory requirement and may require external regulator approval before decommissioning or removal from service can commence.



- c. The following areas shall be considered in the development of the execution strategy document:

5.2.2. Definition of decommissioning objectives

- a. This shall define the objectives of the planned decommissioning process.

It may typically include:

- *Decommissioning to facilitate future change of use of the pipeline.*
- *Decommissioning because the pipeline is no longer required for the current duty, but alternative future use may yet be identified.*
- *Decommissioning and permanent removal from service for pipelines at the end of their useful life with no potential future alternative use.*

- b. The overriding objective of decommissioning shall be to ensure that the pipeline presents no threat to the environment or public safety and limits potential for interaction with adjacent assets or activities and leaves the minimum ongoing liabilities and costs for BP.

5.2.3. Regulatory requirements

5.2.3.1. Consents and permits

- a. The Execution Strategy shall identify governing regulatory requirements and legislative constraints affecting the decommissioning or removal from service process as well as any international conventions or finance or partner agreement constraints which may apply.

Most regulatory regimes have no specific mandatory requirements for pipeline decommissioning or removal from service. However, other industry regulation, legislation, or international conventions may form the basis of the process applied to pipelines by regulators in considering the impact of pipeline decommissioning. Early engagement with regulators is therefore recommended to ensure the Execution Strategy is in line with their requirements.

When the pipeline was first constructed and commissioned, a regulatory permit or planning consent, e.g. PTO, may have been issued to permit the pipeline to enter service as part of the local regulatory process. The regulatory permit or planning consent may contain conditions that have to be met by the pipeline operator in order for the pipeline to have remained in service or to allow it to be decommissioned and removed from service.

- b. Definition of the Execution Strategy shall ensure that the selected methodology for decommissioning or removal from service does not deviate from the PTO unless there is no acceptable alternative as this simplifies the regulatory approval process.

Constraints of the PTO on the pipeline decommissioning and removal from service may have been set a significant time in the past when there was less focus on both short and long term environmental impacts of decommissioning and removal from service. For example, the PTO may simply state that the pipeline shall be removed without allowing due consideration of whether this is the best overall option in line with current expectations.



5.2.3.2. Notification and approval

The range of regulatory bodies or other interested parties who are required to review the Execution Strategy shall be identified as part of the strategy preparation.

The intent to remove a pipeline from service may require notification to the appropriate regulatory or planning authorities. Such notification may be required several years before actual de-commissioning in the context of the normal regulatory process for the production facility end of life management provisions. Each country has its own requirements and level of government or authority to notify (i.e. local, regional, district, central, national, etc.). Examples of the bodies that may require notification or may be required to grant approvals typically include one or more of the following:

- *Health and Safety executive/Department of Occupational safety and Health.*
- *Department/Ministry of transportation.*
- *Department/Ministry of the environment.*
- *Land registration authorities.*
- *Local planning authorities.*
- *Coastguard.*
- *Department/Ministry of trade.*
- *Petroleum officer/ fire fighting authority.*
- *Customs and tax authorities.*
- *System users.*
- *Land owners or occupiers.*
- *Fishing authorities.*
- *Any other authority required to be notified under local regulations.*

5.2.4. Compilation of pipeline design basis and operating and maintenance history

This should include a list of the pipeline components, together with information relevant to the decommissioning including dimensions, pipe specification, coating, wall thickness, weight and conditions, burial status, cathodic protection, defect information, crossings, and interfaces with other third parties.

5.2.5. Review/audit of the pipeline and associated facilities**5.2.5.1. General**

- a. The pipeline design, construction, and operation and maintenance history shall be reviewed to determine or verify the history and the current status of the pipeline.
- b. The findings of this review shall form the basis on which the decommissioning is planned.

Pipelines which have fallen into limited use may have had limited focus or investment applied to manage their integrity. In these cases the decommissioning process itself can present significant hazards and challenges to be managed to ensure that the potentially indeterminate integrity level is not breached during the decommissioning process.

