

PETRONAS TECHNICAL STANDARDS
HEALTH, SAFETY AND ENVIRONMENT

CONCEPT SELECTION
(GUIDELINE)

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AMENDMENT RECORD SHEET

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1 INTRODUCTION

1.1 OBJECTIVE OF THIS DOCUMENT

This document has been prepared to guide the management of HSE during the evolution of development concepts for an existing or potential hydrocarbon resource. The objectives of the document are:

- to provide the initial framework for the management of HSE across the petroleum resource life cycle
- to establish an HSE Management System,
- to describe the specific application of the Hazards and Effects Management Process (HEMP) in concept selection, namely:
 - the HSE objectives to be achieved at each stage
 - the techniques that can be used to achieve the objectives
 - the deliverables expected at the end of each stage.
- to provide pointers for more detailed guidance
- to begin the development of the HSE Case, which will evolve as an integral part of the reference documentation for the asset.

It is not the intention of this document to provide a complete specification of the HSE activities to be undertaken at each stage of a project. It provides guidance on activities that need to be considered by those responsible for project execution. As such it requires the application of skill, knowledge and experience together with advice from HSE specialists where necessary.

1.2 BACKGROUND

Concept selection has the maximum scope of any project phase to remove hazards or minimise associated risks. It is during this phase that the most effective provision can be made to reduce the environmental effects and the risks associated with a process, system or facility to a level that is as low as reasonably practical (ALARP).

Risk reduction can be achieved in a number of ways. In order of preference these are:

- elimination of hazards
- reducing the probability of hazardous events occurring
- minimising the risk of escalation should a hazardous event occur.

Once a concept has been selected and design work started, the scope for radical change to reduce the environmental effects associated with the regular emission characteristics and/or to respond to unforeseen hazards is significantly reduced. Once the hardware has been installed, retroactive implementation becomes relatively less effective, more hazardous and considerably more expensive.

It is crucial that the opportunities available for minimising emissions and risk by concept selection are not lost.

2 OVERVIEW

2.1 SCOPE OF THE DOCUMENT

This document provides guidance on the management of HSE during concept selection, including:

- organisation and procedures
- the HSE tasks and activities that should be performed during each stage
- the output product from each HSE activity
- the HSE contribution to the selection of development concepts.

2.2 AREA OF COVERAGE

The document provides guidance on the HSE issues to be addressed in concept selection.

Concept Selection involves the consideration of a variety of development options. It begins when an existing or potential hydrocarbon resource has been identified for evaluation and development planning. Its output is a proposed development plan for the hydrocarbon resource.

Within the context of the total project development, hazards and effects management in concept selection concentrates on the identification of major hazards and their effects. The decisions made during this phase will have implications for future phases. Below is a synopsis of the changing emphasis of HEMP, complete with an indication of where guidance on each phase can be found.

Concept Selection (PTS 60.0104 this document)	It is during this phase that most of the major hazards and environmental effects will be identified and an initial risk assessment will take place. In this phase there is considerable scope for minimising emissions, maximising energy efficiency, removing hazards and significantly reducing associated risks. The emphasis is on safeguarding HSE by adopting, where possible, an inherently safe, no environmental effect approach, e.g. specifying unmanned rather than manned facilities, placing processing facilities onshore rather
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	than offshore, adopting a no continuous flaring policy etc.
Conceptual Design and Project Specification	During this phase there is still a clear identification and assessment focus, now at a more detailed level of application. The emphasis is on incorporating inherently safe features at a detailed level, and prescribing passive and active control measures for remaining emissions and hazards. These are incorporated into the philosophies and engineering drawings (process engineering flow scheme [PEFS], process flow schemes [PFSs], Cause and Effects etc) which constitute the base documents for the remainder of the design phase.
Detailed Design PTS 60.0107	By the time the detailed design phase is reached, the cornerstones of the HSE safeguards will have been placed. The emphasis becomes directed to the detailed engineering of the agreed control and recovery measures, and developing procedural control and recovery mechanisms.
Construction and Commissioning (PTS 60.0108)	The methods of construction imposed by the design will influence the risks associated with the construction and commissioning phases. Where possible the risks associated with construction should be minimised by design. Residual risks will be fed forward as input to the construction contracting process. Construction execution presents its own hazards, and for major projects a separate construction HSE Case may often be prepared.
Operations PTS	Decisions made during the engineering phase should be compatible with agreed operations and maintenance philosophy. At the handover stage a HSE case should be in existence which formally documents the hazards and effects associated with the facility and the methods for their control.
De-commissioning	Decisions made in the design phase will often have considerable impact on the options available for decommissioning. The physical difficulties associated with decommissioning and the obligations placed on the operator during the decommissioning should be considered during design

2.3 ORGANISATION OF THE DOCUMENT

Chapter 3 specifies the HSE Management System required for concept selection. It explains the HSE Management principles relevant to concept selection. The structure of this section is consistent with PTS 60.0101, HSE Management Systems.

Subsequent chapters describe the HEMP process and the HSE Objectives, Activities and Deliverables for the main project activities. These link directly with the project activities as follows:

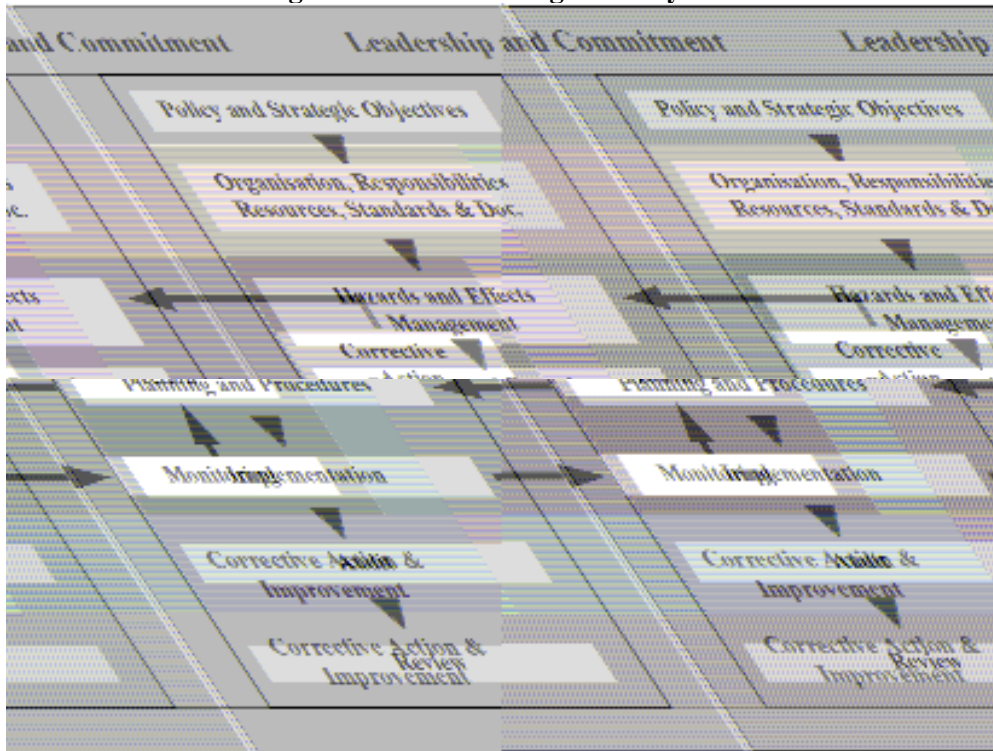
Chapter 4	Collate And Prepare Existing Data
Chapter 5	Establish Subsurface Development Options
Chapter 6	Formulate Development Concepts
Chapter 7	Evaluate Concepts and Propose Development Concepts

3

HSE Management System for Concept Selection

An HSE Management System (HSE-MS) shall be developed and implemented to manage the Evolve Development Concept(s) activity with respect to stated HSE Objectives. The HSE-MS shall be developed in accordance with PTS 60.0101 Group HSE Management Systems Manual and PTS 60.0303 Documenting a HSSE Management Systems & HSE Case. The HSE Objectives shall be specified, adapted and refined under the control of the HSE-MS.

Figure 3.1 HSE Management System



Overview

A management system describes the way a process or activity is managed with respect to its stated objectives (Figure 3.1). It does this by concentrating on critical aspects, ensuring they are properly controlled, measured and reported so as to assure performance and identification of areas for improvement. The introduction of such systems for the management of health, safety and environment is required in many areas by legislators, and many of them now require the production of a facility specific HSE Case.

The implementation of the HSE Management System for a specific development is the HSE Case, which provides assurance that:

- the hazards and effects associated with the asset and its operation have been fully identified and are properly managed
- the assets being operated by the company have been designed and are being operated to meet specified safety criteria and environmental and health standards
- the methods employed to manage risks have been systematically identified and appropriate know-how, controls and verification processes have been applied
- the identified controls are continually assessed and improved by a systematic programme of performance monitoring, audit and review
- there is documentary evidence of the above.

OGP has produced guidelines for HSE Management which have been adopted as the basis for PTS 60.0101 Group Health Safety and Environment Management System Manual. It contains details of the HSE-MS applicable at both corporate and activity level. The remainder of this chapter retains the same structure as that section and provides guidance particularly relevant for concept selection.

The application of the HSE Management System to a specific facility is documented in the HSE Case. The development of the HSE Case begins during the Propose Development Concept(s) activity (see Chapter 7).

3.1 LEADERSHIP AND COMMITMENT

Strong and visible leadership from Management is necessary to promote a culture conducive to minimising risks. Senior Management shall foster the active involvement of employees and contractors towards improving HSE performance by encouraging a culture of belief, motivation, individual responsibility, participation and commitment.

Demonstration of commitment to HSE includes:

- ensuring that HSE criteria are explicitly considered in decisions
- providing appropriate resources for HSE studies and analysis
- communicating (in presentations and documentation) the HSE aspects of concept selection.

3.2 POLICY AND STRATEGIC HSE OBJECTIVES

3.2.1 Policy

Policies are the means by which Management communicate their intentions and

expectations. A policy is a concise statement of belief, principles and direction.

HSE policy documents should form part of a structured hierarchy. At the highest level is the PETRONAS HSE Policy. This in turn has been customised by individual Operating Units (OPUs) into policy statements that reflect local conditions and priorities. The policy is normally restricted to one A4 page of concise action-oriented statements.

For major projects the development of a specific project HSE policy statement, signed by the project team leader should be considered. The preparation of such a document gives a clear HSE focus both internally to the project team, and equally to external agencies, both contractors and regulatory bodies.

The project HSE policy document should set out both the overall policy of the project (which recognises the specific scope and external considerations) and also the roles and responsibilities of the project organisation.

3.2.2 Strategic HSE Objectives

The strategic HSE objectives of concept selection shall be established as early in the activity as possible. Initial guidance is given in Chapter 4.

At the end of the concept selection phase all potential hazards and their effects should have been identified, and the risks arising from them understood. Within the design phase a variety of risk reduction options will be considered, and all those that are reasonably practicable will be incorporated. During the operations phase further scope for risk reduction is available by the application of procedural controls and employee competence assurance.

3.3 ORGANISATION, RESOURCES AND DOCUMENTATION

3.3.1 Organisational Structure and Responsibilities

Single Point Responsibility

It is recognised that at this early stage of a project, a formal project team organisation with a designated team leader may not exist. However, regardless of the size of a design, or structure of the project organisation, there shall be someone who bears single point responsibility for implementation of all HSE objectives. This person is responsible for ensuring that HSE considerations are given importance equivalent to that given to the project cost, schedule and quality.

Two relatively independent tasks face the person responsible for managing the HSE aspects of a project:

- to select the optimum development concept so as to minimise the hazards and environmental effects during construction, commissioning, throughout operating life until eventual decommissioning

- to exercise full control of the HSE aspects in the execution of the project itself (ie the day-to-day HSE risks encountered by the project team such as transport, office and site, health etc).

It is emphasised that decisions made in the concept selection phase have the most impact on the project HSE risks. Decisions made during subsequent design, construction and operation phases only modify the effect of these early decisions.

Interdisciplinary Involvement

Representatives from construction, operations and maintenance should be fully involved from the earliest moment, either on a permanent or part-time basis. They will provide valuable input in the following areas:

- definition and interpretation of the operating and maintenance philosophies
- hands-on experience of operating hazards
- relative merits of hardware and procedural controls for managing hazards
- ergonomics requirements
- development of commissioning and handover plans
- requirements for, and contents of, operating documentation

The personnel seconded for this role should have an adequate level of seniority, experience, vision and authority to ensure that operating hazards are fully identified and that suitable control measures are put in place.

Specialist HSE input

The size and scope of a project will determine the need for full-time specialist advisors in the field of HSE. Where full time HSE staff are not included, the detailed project plan, showing the specific HSE activities planned, shall be agreed with the OPU HSE department to ensure that resources (internal or external) are made available.

In cases where it is proposed to carry out detailed HSE studies using external contract resources, specialist in-house HSE resources can give great added value and should be consulted regarding:

- the choice of contractor
- the scope of work and study objectives