

PETRONAS TECHNICAL STANDARDS

HEALTH, SAFETY AND ENVIRONMENT

GUIDELINE

OPERATING PROCEDURES (OP)

PTS 60.2205

JANUARY 2011



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This revision of **PTS 60.2205 – Operating Procedure (January 2011, Revision 0)** has been updated to incorporate PETRONAS Lessons Learnt, Best Practice and new information issued by relevant industry code and standards. All updates in the document are highlighted in *italic* font.

The previous version of this PTS **60.2205 (September 2008)** will be removed from the PTS binder/ e-repository from herein onwards.

The custodian of this PTS is: Manager - HSE MS, Standards & Regulations, GHSEC.

Please direct any questions regarding this PTS to the above-mentioned.

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PREFACE

PETRONAS Technical Standards (PTS) publications reflect the views, at the time of publication, of PETRONAS OPU/Divisions.

They are based on the experience acquired during the involvement with the design, construction, operation and maintenance of processing units and facilities. Where appropriate they are based on, or reference is made to, national and international standards and codes of practice.

The objective is to set the recommended standard for good technical practice to be applied by PETRONAS' OPU in oil and gas production facilities, refineries, gas processing plants, chemical plants, marketing facilities or any other such facility, and thereby to achieve maximum technical and economic benefit from standardization.

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1.0 INTRODUCTION

1.1 OPERATING PROCEDURES

Objectives

This PTS covering Operating Procedures (hereinafter referred to as “OP”) has been written to provide the guidance and tools necessary to develop and operate a system for managing the risks inherent in operating a process system. It follows and is aligned with the principles described in the PETRONAS Health, Safety, and Environmental Management System (PTS 60.0101: HSE MS) which incorporates process safety standards and requirements.

This PTS provides:

- a reference for OPU/HCUs' line managers and senior staff needing guidance in developing operating procedures,
- a description of methods which can be deployed and links to other documents and standards with guidance on their application.

Structure and Content

Refer to the Table of Contents for an overview of how this PTS is structured.

Format

This PTS is arranged in either hardcopy or softcopy format, which are available on the PETRONAS intranet for downloading and subsequent reference and usage.

User Base

Users of this PTS are expected to be OPU/HCUs and selected contractors. The PTS will either serve as a reference for others to assist in the development of 'in-house' specific reference documents, or will be used as a first-line reference in the case of smaller organizations.

1.2 USING THE PTS

Language

In this document, the recommendations for a course of action are made with varying degrees of emphasis. As a rule:

'shall' indicates a course of action with a required, mandatory status within the OPU/HCUs. The English language equivalent or interchangeable term of “shall” is ‘must.’

'should' indicates a preferred course of action.

'may' indicates a possible course of action.

In this PTS document, the collective expressions of PETRONAS are sometimes used for convenience in contexts where reference is made to the OPU/HCUs in general. These expressions are used where no useful purpose is served by identifying the particular company or companies.

Application

Should any significant deviations be made from the guideline or recommendations in this PTS document, then users are required to inform PETRONAS of the nature and justification for these if it is intended that the deviations are to be permanent.

Feedback

This PTS document is not intended as a static set of rules, but a growing collection of HSE expertise. Users are invited to comment on the PTS to PETRONAS and to suggest changes or additional material which they consider would be useful for inclusion in future revisions.

1.3 RELATIONSHIP WITH OTHER SYSTEMS

This PTS has been designed and written so as to link back to the higher level document, PETRONAS Health, Safety, and Environmental Management System (**PTS 60.0101: HSE MS**).

It has been developed to be an integral part and tool to assist in managing risk within the overall PETRONAS HSE MS. Figure 1 below illustrates the elements of the PETRONAS HSE MS and their interactions.

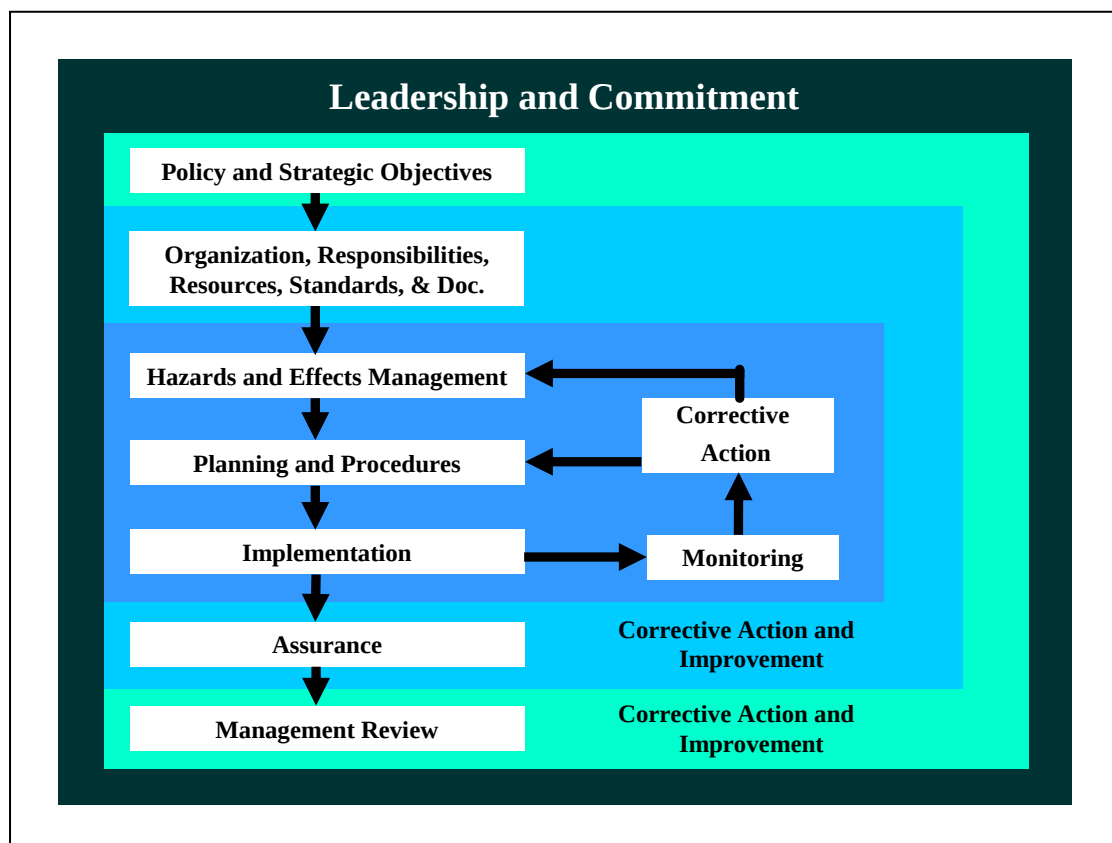


Figure 1: The PETRONAS HSE MS

The activities covered by this PTS fit into the overall PETRONAS HSE MS, and include, but are not limited to, the following examples:

Leadership and Commitment: OPU/HCU Management shall commit and expect all leaders to proactively lead, establish and maintain OP System in their respective OPU/HCU.

Organization, Responsibilities, Resources, Standards, and Documentation: The roles and responsibilities for establishing and maintaining an OP System and to ensure that it is effective, shall be clearly defined within an OPU/HCU's existing organizational structure. This includes designation of responsible personnel / custodian(s) to manage all aspects of the OP System; allocation of sufficient resources to the system; development of standards to ensure suitable, adequate, and effective performance of the OP System on site; and establishment of both document and records control management systems to handle OP-related documentation.

Hazards and Effects Management (HEMP): OP is both an input and output of the Hazards and Effects Management system. As OPs generally represent an operational control, they can provide input to a risk assessment about the current management of hazards, and can be affected by recommendations resulting from a risk assessment where the performance of controls is not deemed adequate, or even non-existent in terms of OPs.

Planning and Procedures: The clear, predictable, and repeatable performance of activities is essential. As such, OP provides a basis for planning activities and a mechanism for ensuring plans are implemented consistently, effectively, and safely.

Implementation and Monitoring : Operating procedures shall be effectively and comprehensively implemented. Training programs shall ensure that personnel are familiar with and competent in the use of OPs. Evidence of the suitable, adequate and effective implementation of OPs shall be available at the OPU/HCUs.

Assurance: From time to time, and based on planned schedules, the OPs themselves and the process for creating and maintaining them shall be subject to PETRONAS Assurance activities.

Management Review: The suitability, adequacy and effectiveness of OP System and the OPs shall be periodically reviewed by the OPU/HCU Management as part of formal and periodic Management Review processes.

2.0 INTRODUCTION

2.1 OVERVIEW

This section deals with the management of OPs and presents a strategy for ensuring that it supports HSE performance, other business aspects, and success of the organization.

Effective OPs are essential for safe and efficient operation of facilities as they establish the steps, actions, and limits required for safe and proper operation.

OPs provide defined, fixed, and safe methods of undertaking the various hazardous operations within a site and includes various warning/cautions and other essential safety information that is critical for ensuring that the facilities are operated within appropriate safety margins. As failure to comply with the requirements of OPs could expose an OPU/HCU to unacceptable risk level, it is essential that all procedures and practices be fully adhered to at all times.

Within the PETRONAS HSE MS, a procedure is defined as:

- a) A documented series of steps to be carried out in a logical order for a defined operations or in a given situation.
- b) A document that describes how an activity is to be performed and by whom.
- c) A document that specifies the way to perform an activity.

In the context of OP System and Process Safety Management, a procedure can be defined as:

“A written step-by-step instruction and associated information (cautions, operating limits, notes, warnings, etc.) of how to proceed, from start to finish, in performing a task safely and properly within operating limits.”

The principle purposes of the OP System are to:

- Identify hazards associated with the specific operations / activities.
- Develop the steps and actions needed for safe and proper operations.
- Provide guidance on formatting and presentation of the steps.
- Define a process for identifying training needs.
- Present guidance on effective implementation of procedures.
- Describe mechanisms for assessing performance of OP
- Adequately document all the above.

2.1.1 Aim

The aim of OP System is to provide clear instructions on how to consistently conduct work activities such that risks are managed to an acceptable level.

For OPU/HCUs, this aim requires a sufficient understanding of the creation, development, and implementation of OP System such that its benefits as a key risk management process can be realized.

Effective implementation of OP System is the responsibility of the OPU/HCU.

2.1.2 Expectations

When implementing OP System, the OPU/HCU shall ensure that the following expectations, as a minimum, are delivered:

- **All normal, abnormal, and emergency tasks shall be described in OP(s).** There are a number of foreseeable states for a process system, and there should be OPs covering all of these conditions. It is up to the individual OPU/HCU to determine how their OP documentation will cover these various states in their process system.
- **Hazards, including human behaviour and error, associated with conducting the procedures and practices shall be identified and controls put in place to manage them.** Operating procedures should ensure that in addition to defining how to conduct a work activity in a safe manner, they will also anticipate and manage failures to comply with requirements.
- **Operating procedures shall define the activities to be completed, method and/or tools to be used, data to be recorded, operating conditions to be maintained, samples to be collected, and health, safety, & environmental precautions to be taken.** In defining the steps, OPs shall describe the totality of actions to be completed, how they should be completed in a safe manner, and the deliverables required for the activity. Where regulatory requirements are present, the OPs should ensure compliance with the requirements.
- **Operating procedures shall be maintained in a controlled manner to ensure their integrity and accuracy.** Document control processes shall be applied to ensure that procedures are suitably reviewed, approved, published, and maintained.
- **Training shall be conducted to ensure users of OPs are aware of their existence, understand their applicability, and are competent to apply their requirements.** Each procedure shall have an accompanying training needs assessment describing who needs to know about it, and what training needs to be done and how. The expectations about the competency of individuals using the procedures should be defined.
- **The development, review, and update of OPs shall be triggered by key events within other management processes.** As a key part of the risk management process at the OPU/HCU, the OP System has a close relationship with other management system/processes and responds to their needs.
- **The ongoing quality and technical accuracy of OPs shall be monitored and actions taken where necessary.** As the process system and the operating environment changes, OPs need to be reviewed, updated, and improved to ensure they remain valid. Operating procedures shall have their minimum review frequencies defined.

2.1.3 Links with Other System Elements

The following HSE MS processes will normally have a direct link to the OP System. It is the accountability of the OP Custodian to ensure that all suitable links are identified for their relevance on a case-by-case basis

- **Management of Change (MOC)** – OPs shall be subject to OPU/HCU MOC processes if there is a need to modify them.
- **Design Integrity (DI)** – OPs will support activities related to the application of the requirements of the Design Integrity process.
- **Mechanical Integrity (MI)** – OPs are required to support MI programs in ensuring that work is done in a suitable, consistent, and safe manner.
- **Process Hazard Analysis (PHA)** – PHA tools for hazard identification and risk assessment (e.g., HAZOP, etc.) may identify requirements for OPs to be used as a control technique for risks identified
- **Process Safety Information (PSI)** – PSI is essential for development of effective OPs i.e. providing information on safe operating envelope, methodology, tools, etc.
- **Proprietary and Licensed Technology Assessment (PLTA)** – Input from licensor/proprietor is required for development of effective OPs. Care shall be taken to ensure integrity of Intellectual Property is not compromised.
- **Training and Competency** – Trained and competent personnel are essential for the safe implementation of the OPs. As such, OPs may initiate review and update of training and competency development processes.
- **Assurance** – Operating procedures shall be subject to Assurance activities, which assess and verify their suitability, adequacy, and effectiveness when used.

2.1.4 Basis and Compatibility

This PTS :

1. Is based on PTS 60.0101 : HSE MS, which provides “global” HSE management system guidance for PETRONAS companies.
2. Complies to local Legal Requirements where the OPU/HCU operates, such as CIMA Regulations, Malaysian Labor Law, etc.
3. Is compatible with the ISO 14001 : 2004 Standard for Environmental Management Systems and the OHSAS 18001 : 1996 Specification for Occupational Health and Safety Management Systems.
4. Incorporates other internationally accepted “best management practices.”

2.1.5 Overall Roles and Responsibilities

The roles and responsibilities of individuals involved in the development, application, supervision, monitoring, and review of the OP System shall be defined by each OPU/HCU. An acceptable means for doing this is the use of RACI Chart, an example of which is shown in Appendix 1

OPU/HCU shall have an OP Custodian who is appointed to oversee and manage the OP System and monitor its performance.

3.0 STRUCTURE OF THE OPERATING PROCEDURES SYSTEM

3.1 BACKGROUND

As with all management systems, the OP System has a defined structure. The purpose of this structure is to provide a framework of common formats, references, and interfaces that ensure that the procedures are consistent in their content, presentation, and quality, and are aligned in their objectives.

Figure 1 presents a suitable structure for OPU/HCU's to adopt and modify to meet their needs. However, all of the items defined below are essential and should be incorporated into any modified structure.

Further details are given in the remaining sections of this document. In addition, APPENDIX 4 - KEY POINTS OF THE STRUCTURE OF OP SYSTEM provides a summary of the main points and requirements of the model given on the following page.

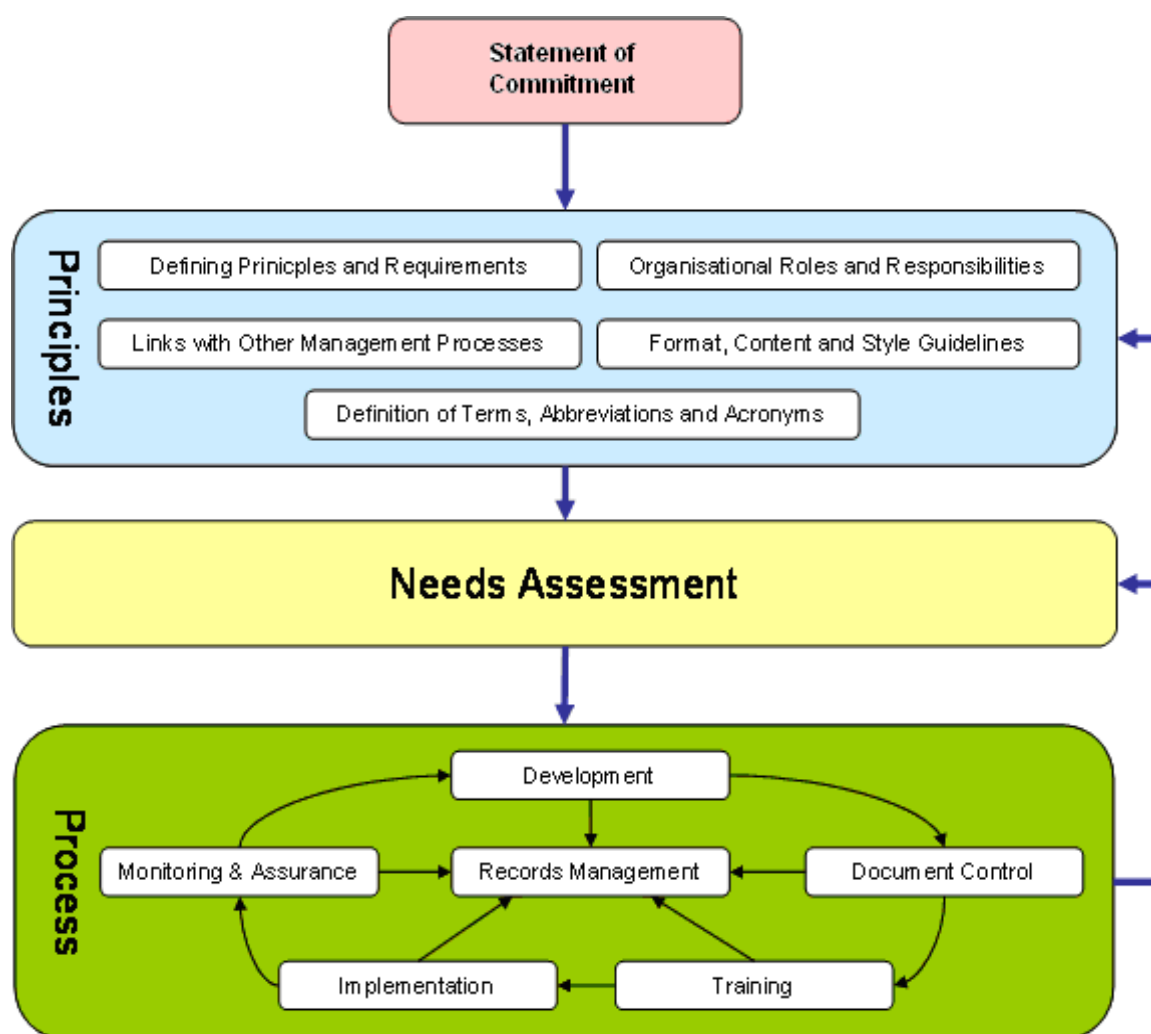


Figure 1 - Structure of OP System

3.2 STATEMENT OF COMMITMENT

OPU/HCU should document a statement on organisation's commitment to the OP System and sets the overall standards and expectations regarding OPs.

The format, style and wording of the statement of commitment will depend upon the OPU/HCU and its existing provisions. However, given the central role OPs play in ensuring ongoing, safe, consistent, and predictable operating performance, it is essential that standards of behaviour with regard to their use is very clearly and formally defined.

The aims and expectations defined in Section 2.1.1 and 2.1.2 regard the attributes of the OP System and are a starting point for the development of the statement of commitment. However, the behavioural aspects may include:

- The management shall develop and maintain a comprehensive and available OP System to ensure consistent and safe operating activities.
- All personnel shall comply with the requirements of OPs.
- Where the requirements of OPs are considered to be inaccurate, incorrect or missing, work shall stop until advice is sought from a suitable technical authority.

The statement of commitment may be incorporated into a wider operating policy covering the activities of operations and production departments. However, it may be posted in areas where relevant personnel will see it, such as meeting rooms, canteens, control rooms, permit offices etc., and should be the subject of discussion at group meetings.

4.0 PRINCIPLES

The principles define the basis for the development of the OPs as described below.

4.1 DEFINING PRINCIPLES AND REQUIREMENTS

The principles and requirements under which the OP System operates are consistent for all OPU/HCU's. Deviation from these principles and requirements is only permissible if equivalence can be demonstrated.

4.1.1 Scope of Operating Procedures

Operating procedures shall cover the following operational activities:

- **Start-up Operations:** Operating procedures that must be executed to achieve normal operating conditions. There are three different start-up cases:
 - Start-up from construction and commissioning as a result of a new installation.
 - Start up after a turnaround or a total shutdown.
 - Start-up after emergency / partial shutdown to bring up a unit and/or equipment after an emergency situation to achieve normal operating conditions.
- **Normal Operations:** The specific tasks required to maintain safe operation. The purpose of the normal OPs is to describe the manner in which routine tasks need to be performed so as to avoid incidents.
- **Abnormal Operations:** Procedures that contains actions required when operating conditions deviate from defined limits. It is necessary to clearly indicate what to do, when it is to be done and to what degree permitted.
- **Emergency Operations:** Operating procedures that must be accomplished quickly to facilitate proper management of the unit. Emergency procedures shall include the conditions under which emergency shutdown is required to be executed in a safe and timely manner.
- **Shutdown Operations:** Operating procedures that must be executed to shut down the total or partial unit / equipment from normal and abnormal. Operating conditions to a non-running state.
- **Special Operations:** High-risk operations, usually involve multiple parties or specific to area of activity, e.g., lifting over live equipment, line stoppling, new tie-ins, bypassing equipment or facility.
- **Temporary Operations:** A procedure that is implemented on a short term or trial basis, usually for a one-off task. The temporary procedure will have a clearly defined period of validity, after which it will be withdrawn.
- **Preparation for Handover and Hand-back:** This is normally as a follow-up from a shutdown, pre-start-up preparation or normal operations (e.g., switching of pumps). This process is typically

managed by daily instructions, the permit to work system (PTW), Job Safety / Hazard Analyses, etc.

- **Abandonment or Decommission** : Operating procedures that must be executed to properly shut down and eventually total decommissioning and abandonment of the facility

4.1.2 Documentation Types

There are a number of types of OP documentation:

- **Procedure**: A written step-by-step tasks and associated information (cautions, operating limits, notes, warnings, etc.) of what, when how to proceed and who is responsible to perform the activity within operating limits. In some cases, it can be further categorised as instruction, guideline etc
- **Form**: A document used to record data and information and provides a record of an activity, e.g., operation logbook, checklists, etc.
- **Record**: Normally are completed forms or generated document as a result of executing tasks, e.g., daily instructions, minutes of meeting, completed audit forms, completed start-up procedures where the steps have been initiated by the end users, etc.
- **Practice**: Established way of working that does not have a step by step procedure but contains a well define set of rules for completing the activities, e.g., Unit Accountability Guidelines, Area Team Roles and Responsibilities, routine checks, etc.

However, within the PETRONAS OP System, it is not intended to develop a separate document structure for practices, and the normal procedure format and style (including forms and checklists) should be modified as appropriate for documenting practices.

There are a range of HSE procedures and practices, e.g., Permit to Work, Job Safety Analysis (JSA), Accident Investigation, etc., which are used directly in day-to-day operational activities to manage work activities while not necessarily a component of OP. Compliance with these procedures and practices is also essential in ensuring safe operations of the facilities.

4.1.3 OP Standards

The following standards define the requirements that shall be met in all OPs and related activities. Where an issue arises that is not covered by the existing requirements then the issue shall be addressed in a manner consistent with these standards.

OP Documents

- All OPs shall be managed in accordance with the document control system. They shall be reviewed at a maximum period of 3 years or in response to events such as investigations, reviews, studies, reports and audits to ensure the hazards and risk identified through these means are appropriately addressed.
- All OP documents shall be prepared in accordance with the requirements laid out in this PTS or equivalent documents defined by the OPU/HCU.