

PETRONAS TECHNICAL STANDARDS

HEALTH, SAFETY, AND ENVIRONMENT

MANAGEMENT OF CHANGE (MOC) (GUIDELINE)

PTS 60.2201

OCTOBER 2006



1. PREFACE

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

They are based on the experience acquired during the involvement with the design, construction, operations 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 HCU/OPUs 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.

The information set forth in these publications is provided to users for their consideration and decision to implement. This is of particular importance where the PTS may not cover every requirement or diversity of condition at each locality. The system of application and usage for each PTS is expected to be sufficiently flexible to allow individual operating units to adapt the information set forth in each PTS to their own environment and requirements.

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2. INTRODUCTION

2.1 MANAGEMENT OF CHANGE

Objectives

This PTS regarding Management of Change (hereinafter referred to as “MOC”) has been written to provide the guidance and tools necessary to develop and operate a system for managing and controlling change with respect to business, operational, and HSE matters in PETRONAS HCU/OPUs at the corporate and business activity levels, following and aligning with the principles described in the PETRONAS Health, Safety, and Environmental Management Systems (PTS 60.0101 : HSE MS) which incorporates process safety standards and requirements.

This PTS provides :

- a reference for HCU/OPUs’ line managers and senior staff needing guidance in the essential MOC requirements of any area of PETRONAS operations.
- a route map and linkage to more detailed references and cross-references 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 on MOC are expected to be HCU/OPUs and selected contractors. The PTS will either serve as a reference for others to assist in the development of 'in-house' specific operational documents, or will be used as a first-line reference in the case of smaller organizations.

2.2 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 HCU/OPUs. 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 HCU/OPUs 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.

2.3 RELATIONSHIP WITH OTHER SYSTEMS

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

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

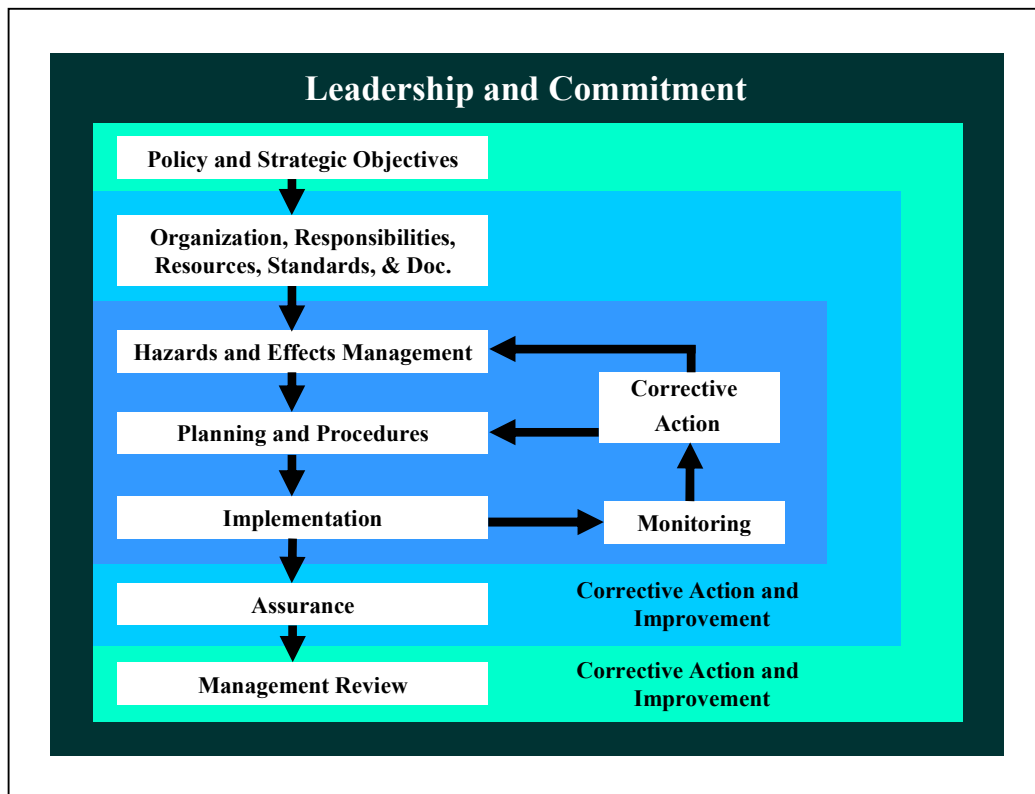


Figure 1 - The PETRONAS HSE MS

The MOC activities covered in this PTS fit into the overall PETRONAS HSE MS, and includes, but is not limited to, the following examples:

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

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

Hazards and Effects Management (HEMP): MOC processes shall be suitably, adequately, and effectively integrated into the Hazards and Effects Management system, and vice-versa. This commonly and minimally would require that all proposed / required changes or modifications be subject to a relevant and robust risk assessment process prior to such changes being approved. Furthermore, a HEMP activity may also trigger an MOC process.

Planning and Procedures: All business / HSE planning activities shall consider the potential effects of change, and the potential effects of NOT introducing change, where a change may be necessary. Documented procedures shall be in place to manage change.

Implementation and Monitoring: Evidence of the suitable, adequate, and effective implementation and monitoring of the MOC System shall be available at the HCU/OPUs. Where other systems are implemented, and require change, MOC may need to be applied.

Assurance: From time to time, and based on planned schedules, the MOC System shall be subject to Assurance activities.

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

Amendment Record Sheet

PTS Number: 60.2201

PTS Title: Management of Change (MOC)

Rev. No.	Chapter Nos.	Description of amendment	Date dd / mm / yy	Amended by
0	All	First Version	19 / 10 / 06	PSM Workgroup

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4. MANAGEMENT OF CHANGE

4.1 OVERVIEW

This section deals with changes and presents a strategy for ensuring that such changes do not adversely affect HSE, other business aspects, and success of the organization.

Many incidents include direct and indirect causes with origins in change management failures. The cause-and-effect relationship associated with introducing changes to facilities, processes, tasks and procedures, work practices, operating conditions, human resource and manpower strategies, and any other element of the management system, if not anticipated and dealt with, could directly result in serious losses being sustained.

▪ Aim

The main aim of MOC System is to ensure that a proper level of review(s) is applied to prevent adverse effects from changes. MOC ensures that safety of the installation and its personnel is not compromised by inadequate evaluation of hazards related to change. Appendix 1 illustrates the basic MOC process.

The goal of MOC process is to provide a coherent, systematic, and as simple a strategy as possible for all end-users to implement in order to ensure that changes considered produce their intended benefits without adverse side-effects.

From a more specific process safety point of view, MOC is the discipline of identifying the components of a continually evolving system in an HCU/OPU including their system interfaces, for the purpose of controlling changes to these components and maintaining integrity and traceability throughout the system life cycle.

For HCU/OPUs, this requires ensuring that proper sequences and levels of review are consistently applied to prevent adverse effects from changes.

Well implemented, MOC ensures that the health, safety, and environment of the HCU/OPUs and their personnel are not compromised by inadequate evaluation of hazards, threats, and other potential undesired events related to change, and the intended benefits of the change are fully realized as planned.

4.1.1 Expectations

For each HCU/OPU implementing an MOC process and procedure, there should always be clear expectations and outcomes as a result of such implementation. As a guideline, HCU/OPU Management shall ensure that the following expectations, as a minimum, are delivered whenever there is a request or requirement for change in the HCU/OPU:

- ***All changes shall be defined as to their scope and nature.*** The HCU/OPU's MOC System shall require that each request, idea, and/or need for change be initially defined by the Change Initiator, so as to make screening of the change as accurate as possible. Scope should take into account boundaries such as time and space for the change, geographical location of the change, whom it would affect, etc. The nature of the change should be identified taking into account the Facility and Process, Organizational, Procedural change, and/or a combination of these three types.
- ***All Facility and Process, Organizational, and/or Procedural changes shall be subject to proper hazard identification and risk assessment reviews.*** It can be argued that any change is critical and will have adverse effects until proven otherwise. For this reason, any request or requirement for change must be subjected to a suitable risk assessment as defined in the Hazards and Effects Management Process (HEMP), PTS 60.0401. Depending on the nature and complexity of the change, an appropriate type of risk assessment tool must be chosen.

Examples of risk assessment tools may include:

- HAZOP
 - Failure Mode and Effect Analysis (FMEA) / Fault Tree Analysis (FTA)
 - Job Safety Analysis (JSA)
 - What-If? / Structured What-If? Techniques
 - EIA
 - QRA
 - Simple Risk Assessment / Brainstorming
- ***During change reviews and when change review is completed, endorsement by the proper level of authority shall apply.*** HCU/OPUs shall define the levels of Management required to approve and endorse the change as it progresses through its various stages. The over-riding principle is that the more complex and extensive the change, as well as the more stages of approval a change has to go through, the higher the level of HCU/OPU Management that shall be involved as Owners of the process. Additionally, one overall Owner shall be appointed to coordinate and shepherd the entire change process for each MOC case.

It is important that a process of ownership of the change apply throughout the entire change process. Depending on the nature of the change, this process may include a few, several, or many levels requiring authorization to continue on to the next stage of the change. Such ownership also helps to ensure that proper follow-up is taking place immediately at each stage before the change can proceed to the next stage.

- ***The MOC process shall identify and consider suitable and sufficient information to support the process.*** In order to ensure a robust MOC process, sites shall have supporting input and output documentation so as to make the change process history traceable. Input documentation shall include procedures for managing change, forms, templates, and checklists to record requests for change, conduct risk assessments, create MOC plans, etc. Additionally, key information such as Process Safety Information, Operating Procedures, Design Integrity documents, etc., shall be available as key inputs. Output documentation includes the change requests submitted by Change Initiators, risk assessment results and reports, documented MOC plans, monitoring and closeout reports, and evidence of the decisions made with respect to the change throughout the entire change process, etc.
- ***MOC shall ensure that the change is reflected on all relevant documents.*** All process safety-related information and affected operating procedures shall be appropriately reviewed, revised, and updated as necessary if the change affects such information.

It is the responsibility of the MOC Custodian(s) to ensure that information, such as process safety information, is included as part of the change management process, as a potential system element that may be affected.

The Change Owner(s) must be aware of the system linkages that the change may affect. How documentation may be affected as a result of an MOC process is detailed in the section “Links with Other System Activities.

- ***MOC shall ensure that the change be communicated and / or training provided to affected personnel.*** Once a change is approved for implementation, the Owner(s) shall ensure that all affected personnel are identified, before the change implementation begins, in order to communicate all aspects and implications of the change, and to identify and provide appropriate training to those who need training so that they may better manage the change at the HCU/OPU.

For identification purposes, those who may need to be communicated to and given training include :

- Employees working directly with, and affected by the change : maintenance personnel, operations personnel, etc.
- Employees indirectly affected by the change: Personnel assisting the above, such as Human Resources, Procurement, Training, Engineering, Medical, ERP Team members, etc.

- Relevant level of HCU/OPU Management
 - Contractors
 - Visitors
 - Suppliers
 - Neighbouring installations and communities
 - Other stakeholders.
- ***The MOC process shall be continually monitored, action tracked, and improved – both on usage compliance level as well as on the system level.*** HCU/OPU Management, in their ongoing commitment to continual improvement, shall also ensure that their site MOC System includes monitoring, action tracking, and Assurance activities.

Monitoring and action tracking activities should seek to ensure that each change that is requested and approved for implementation is monitored until the change is closed-out.

This includes:

- Monitoring the suitability, adequacy, and effectiveness of the change management process
- Monitoring the affected working environment during implementation of the change,
- Monitoring the affected working environment, for a defined and reasonable amount of time, *after* the change has been put in place for any possible side effects or side benefits,
- Any resulting corrective and/or preventive actions identified and required to be taken as a result of monitoring activities shall be entered into the HCU/OPU's action tracking system for timely follow-up and close-out,
- Driving the change to timely completion.

Assurance activities should be directed towards assessing the entire system for managing change at the HCU/OPUs.

This includes:

- Identifying strengths of the system, learning from such success, and applying the success to other areas requiring improvement,
- Identifying weaknesses of the system, learning from such weaknesses, improving the weak areas of the system, and ensuring that the same weaknesses don't arise in other areas of the change management system.

4.1.2 Links with Other System Activities

The following HSE MS activities will normally have a direct link to the MOC activity. It is the responsibility of the Change Owner and his/her team to ensure that all suitable links are identified for their relevance on a case-by-case basis, and if affected, appropriate change control measures are identified, implemented, and monitored.

- ***Design Integrity (DI)*** – Change related to design of new and/or existing facilities and processes shall observe the requirements of MOC.
- ***Mechanical Integrity (MI)*** – Under MOC, the change shall be managed so as not to adversely affect the mechanical integrity of the equipment and the facilities. Where new equipment, components of equipment, and/or new way(s) of maintaining equipment, is involved, the related Mechanical Integrity documentation shall be updated.
- ***Operating Procedures (OP)*** – Certain changes may affect the way of operating, hence applicable

Operating Procedures shall be reviewed and updated accordingly. Changes to the Operating Procedures are also subject to a procedure review process.

- **Process Safety Information (PSI)** – MOC shall ensure that the change is reflected on affected Process Safety Information documentation and records. Evidence of the change(s) made to the Process Safety Information shall be based on site document control procedures with respect to revision numbering, dating, traceability, etc. Conversely, accurate Process Safety Information is a critical input to the MOC process.
- **Process Hazard Analysis (PHA)** – PHA tools for hazard identification and risk assessment (e.g., HAZOP, etc.) shall be employed for MOC. Likewise, the results of PHA may initiate an MOC process
- **Pre-Activity Safety Reviews (PASR)** – These reviews may also generate findings which trigger recommendations for change, which shall be managed by MOC. Implementation of the change itself shall be subject to an appropriate PASR(s).
- **Proprietary / Licensed Technology (PLT)** – The acquisition, introduction, and use of licensed or proprietary technology in an HCU/OPU shall require an assessment and managed by MOC.
- **Training** – Change(s) to equipment, system, organization, procedures, and methods, shall be identified, communicated, and/or training provided to all affected personnel.
- **Emergency Response Plan (ERP)** – Emergency plans and other resources may require updating as a result of the addition or modification of equipment and systems.
- **Hazards and Effects Management Process (HEMP)** – Risk assessment activities carried out under the HEMP may trigger recommendations for change, which shall be managed by MOC.
- **Assurance** – Assurance activities may generate findings which trigger recommendations for change, which shall be managed by MOC.
- **Incident Investigation** – Investigation findings and their remedial action plans may trigger recommendations for change, which shall be managed by MOC.
- **Contractor Management System** – Contractors themselves may propose change(s) at the HCU/OPU's worksites, and this shall be managed by the HCU/OPU's MOC System. Conversely, the site MOC System may affect contractor work activities.

4.1.3 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 HCU/OPU operates, such as CIMA regulations, Malaysian Labor Law, etc.
- 3) Compatible with ISO 14001 : 2004 Standard for Environmental Management Systems and the OHSAS 18001 : 1999 Specification for Occupational Health and Safety Management Systems.
- 4) Incorporates other internationally accepted “best management practices.”

4.1.4 Overall Roles and Responsibilities

The roles and responsibilities of individuals involved in the development, application, supervision, monitoring, and review of the MOC System shall be defined by HCU/OPU Management. An acceptable means for doing this is the use of RACI Chart, an example of which is shown in Appendix 4.

HCU/OPUs shall have an MOC Custodian who is appointed to oversee and manage the system and monitor its performance. The PHA Custodian position shall be defined by the HCU/OPU.

Additionally, each individual proposed and approved change case shall have an appointed Change Owner to oversee the correct and effective application of the MOC procedure, including the Change Cycle.

5. CHANGE MODEL

5.1 TYPES OF CHANGE

Within an HCU/OPU consideration and holistic thinking must be given as to what may prompt or entail a change. As a minimum, needs for change to facility and process, organizations and procedures or combination of them may arise and need for managing the changes shall be considered.

It should be noted that “*replacement-in-kind*” does not require MOC. An example of replacement-in-kind is change of a gate valve with a similar gate valve of similar specification. However, replacement-in-kind change needs to be fully considered as equipment of similar configuration may have a different detailed specifications.. For example, a new model of pump may have higher discharge pressure or a dead head pressure . When in doubt, initiate the change request and follow the MOC process.

5.1.1 Facility and Process Related Change

Typically, Facility and Process changes relate directly to the need to change or modify the asset, equipment, tools, chemicals used, etc. Examples include, but are not limited to:

- Instrumentation and its logic
- Alarm set-point
- Safeguarding systems / safety interlocks
- Raw materials / feedstocks
- Non-standard repair
- Codes and standards / engineering specifications
- Design and construction
- Commissioning & testing
- Equipment / tools
- Chemicals & catalysts
- Software
- Process conditions (temperature, flow, pressure, etc.)
- Production throughput
- Materials of construction
- Process material quality
- Equipment load factors
- Traffic patterns
- Operating limits and envelopes on process and equipment
- Product quality
- Office layouts.

For Change Owners, these points should be kept in mind when dealing with Facility and Process changes:

- Usually the changes are easily identified and defined.
- Skills usually exist to effectively manage the risks.
- Multiple changes make tracking and close-out a challenge.
- Many people / departments are typically involved.

- The cumulative effects of many changes and changes-within-changes complicate MOC processes.
- Asset Owners should be involved in championing the change and approving it to proceed.

5.1.2 Organizational Related Change

Typically these involve changes or modifications to the organizational structure and size, manning, personnel, etc which may have adverse HSE effects. Appendix 5 includes a checklist for managing Organizational change. Additionally, examples of organizational change may include, but are not limited to:

- Employee capacity – increase (hiring), decrease (leaves, terminations, retirements, redundancies, etc.), mental, physical, etc.
- Skills allocation (placement after hiring)
- Workflow / personnel placement
- Company policies, such as Manning, Contracting, Hiring, etc.
- Employee programs, such as Wellness, Welfare, Counselling, etc.
- Compensation changes, such as changes in work conditions / scheduling.

For Change Owners, these points should be kept in mind when managing organizational changes:

- The main challenge is to ensure competency and capability to manage the organizational change within both the Human Resources department and relevant Line Departments.
- Organisational changes have widespread impacts inside and outside the company.
- Defined roles and responsibilities are critical for managing organizational changes.
- Communication, consultation, and training are critical to the success of the change process.
- Defining the benefits expected helps keep a focus during the change process. Every request for change should have a defined benefit or set of benefits.
- Managing the transition is tricky, as the change's benefit cannot be readily realized or predicted until the change is already in place - which may be too late.
- Leaders need to be active and visible in constantly communicating, reassuring, and consulting those involved and affected. Application of behaviour management techniques may support the organizational change process, such as conducting task and behavioural observations.

5.1.3 Procedural Related Change

Changes to procedures which may have adverse HSE effects shall be managed by MOC. Changes initiated here typically affect both document control and records management systems, in both electronic and hard copy formats. Examples may include:

- Policies
- Manuals / references
- Procedures / work instructions
- Data collection procedures for Records, Reports, Surveys, Studies
- Work practices.

For Change Owners, these points should be kept in mind when managing procedural changes:

- ISO9000 quality systems usually provide a basic and sound mechanism for managing the change to controlled documentation but don't cover the contents of the procedure. This is normally covered in

documents which describe “the procedure for creating and maintaining procedures” such as the Operating Procedures activity (See PTS 60.2205).

- Risk management and human error is often informally considered, and thus too weak.
- Responsibilities need to be carefully defined as performance standards.
- Validation of the procedure with the end users should be required as this often yields the greatest benefits.
- Changes to procedures are triggered from all sorts of sources. Identifying the intent for the change and its source is important.
- Communication of and training in the new or modified procedure is critical to its successful implementation.
- An appropriate Change Owner shall be appointed for each procedure change and drive the change process.

5.2 THE CHANGE CYCLE

HCU/OPUs shall develop documented procedures that consider and address all the components of a change cycle. While many models exist reflecting this process, the basic components can be Figure 2 as follows :

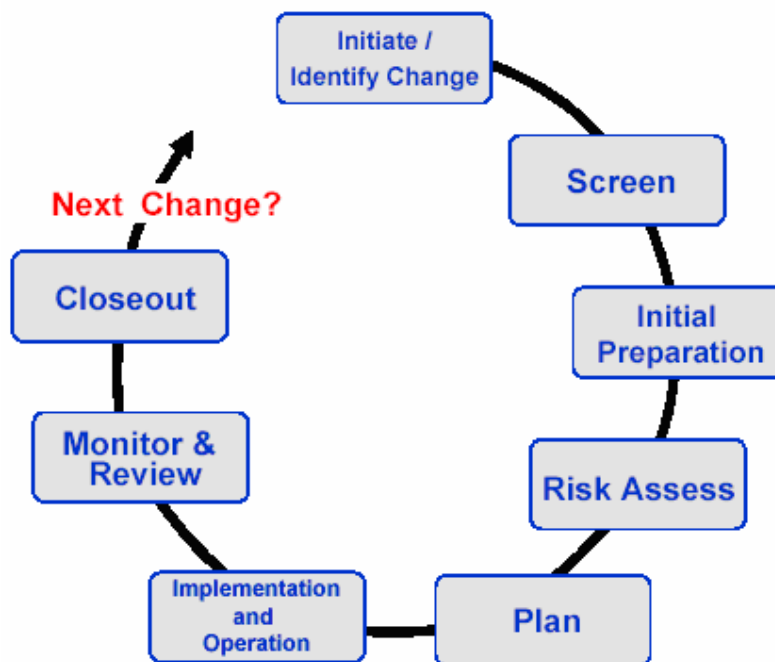


Figure 2 - The Change Cycle

The following basic requirements shall be managed:

5.2.1 Initiate / Identify Change

Changes in the workplace are inevitable. They may arise intentionally or unintentionally. Therefore, HCU/OPUs shall have a mechanism that allows for changes to be initiated or triggered. An initiated or triggered change includes any potential change in the way the business is carried out. At this initial stage, the Change Initiator shall define the expected benefits and potential risks of the change as specifically as possible.

These needs for change may arise in several different forms including strategic decisions, risk assessments, employee suggestions, management reviews, Assurance findings, technology advances, incident investigations, and any of the steps in the asset's lifecycle (design - construct - commission - operate - maintain - modify - decommission - abandon).

Since this is the beginning of the Change Cycle process, formal documentation of this process begins here as well, with appropriate initiation of change and change approval templates, checklists, etc., all managed in an appropriate change management case filing / recording system. Appendix 3 contains a sample "Change Request and Approval Form (CRAF)" which can serve as the basis for change initiation for Facility and Process related changes.

For example, HCU/OPUs shall develop a "Change Log." This should give summary details of the change, indicate the names of all of the key personnel responsible for managing different elements of the change process, and shall be regularly updated to reflect the current condition of the change process.

5.2.2 Screen

Once a change has been identified, a screening shall take place to determine whether the identified change has the potential to impact the current HSE and business environment at the HCU/OPU, and whether or not it shall proceed. The HCU/OPU shall determine who is to conduct this review, when it shall take place, and what the review shall encompass.

This initial screening should be guided by a site checklist. Appendix 2 provides an example of a Change Screening Checklist that can be appropriately customized or modified by the HCU/OPUs. The checklist used during an initial screening should be seen as a 'starter set.' Reference should also be made by the HCU/OPUs to their Hazards and Effects Register for assets, which can also provide insight and an indication of the hazards and controls for those assets affected by the change and which can then be used to identify any impact(s) and supplement the initial review screening.

The "Reviewer(s)" should describe the change and both the opportunities and threats it presents, then review the list of potential impacts to determine whether existing procedures and controls are adequate to manage the changes without increasing the risk to people / environment / asset / or company reputation.

The Reviewer(s) must also consider whether the change can impact other areas in the system, the level and extent of risk assessment(s) required, the possible costs and the ability to finance the change, and must also consider the transition risks, over time, of making the change. A key consideration will be to define measurable indicators of the benefits of the change for the monitoring and review stage. These may include return-on-revenue, production throughput, HSE consequences, legal requirements, etc. The Reviewer(s) should also refer to competent specialists if their own knowledge is not adequate to fully understand the risks and issues.

Once the screening is complete, HCU/OPU Management shall formally review and approve / endorse the screening, and make the decision as to whether or not to proceed with the change.

5.2.3 Initial Preparation

If a proposed change has been approved, meaning that it has passed the initial screening, Change Owner(s) and Change Implementer(s) should then begin the initial development of the change in order to determine how the change shall be implemented, as defined by the HCU/OPU's MOC System. Such initial development shall be documented.

This will entail the development of specifications, designs, action plans, etc., to address the needs of the change (Facility and Process, Organizational, and/or Procedural) in all areas of the OPU/HCUs' HSE MS that are affected by the proposed change. The deliverable is suitable and sufficient information for the risk assessment stage.

The initial preparation stage gives the Change Owner(s) and Change Implementer(s) the opportunity to not only think about the change itself and its risks, but to also start considering the risks in

implementing the action plan to achieve the proposed change.

5.2.4 Risk Assessment

A more detailed risk assessment of the change is required to determine opportunities to reduce overall risk, and to determine additional control or mitigation measures to reduce the consequence :

- During the implementation of the action plan designed to achieve the change (see discussion of “Transition Risks” below).
- Once the change has been implemented / achieved (the end-state of the original proposed change).
- After the change has been in place / for a defined, reasonable time period during the life of the change (the “cradle-to-grave” concept).

HCU/OPU Management shall ensure that processes are in place to determine the suitable risk assessment tools to be used based on the scope and magnitude of the proposed change, and who shall conduct such assessments. A team approach should be used.

- The MOC Custodian determines the formal risk assessment technique to be used and assess the change proposal to establish the detailed nature of the associated risk. The Team is encouraged to seek assistance from other interested people and specialists as appropriate to complete the risk assessment / checklists / procedure / etc., accurately. Guidelines for conducting risk assessment is discussed in PTS 60.2204 : Process Hazard Analysis
- Supplemental studies may be required to support the risk assessment(s), such as gas dispersion models, blast analyses, etc.
- There may also be a need to repeat or revisit the original risk assessment (and use another risk assessment tool if required) if there is a significant change in the assumptions made regarding the change. If the change is “major,” there may be a need to review and update CIMAHA-related Industrial Activity Report(s) as well.
- The assessment process and its findings must be recorded in an appropriate “Risk Report” format. The report should present an overview of the proposed change. The assessment process and results should be described. The findings should clearly state the measures to manage the identified hazards and the justification that they are adequate. The report should include a demonstration that the combination of selected measures satisfies the PETRONAS criteria set for HSE performance.

Depending on the level of risk and subsequent review, the Risk Report will differ. The Risk Report from a change proposal with a low risk rating may simply be a statement of the control procedures which have been identified as adequate to manage the change.

The Risk Report for change proposals of high or medium risk might be the output of risk and engineering studies, and a comprehensive action register for implementation of the additional controls identified.

In these instances the Risk Report shall also include assessment of Facility and Process, Organizational and Procedural risks, as well as the Transition Risks (in both time and space) inherent in these three.

Transition Risks are those caused by the actual process of change rather than the end-state of the change.

It is during the transition where there is generally the greatest risk exposure as old controls stop working and new controls are not yet fully in place. Normally our goal is to reduce risk after the change, but this may not always happen. This may be because risks were not well managed *during the change transition*. The diagram in Figure 3 below illustrates this issue.

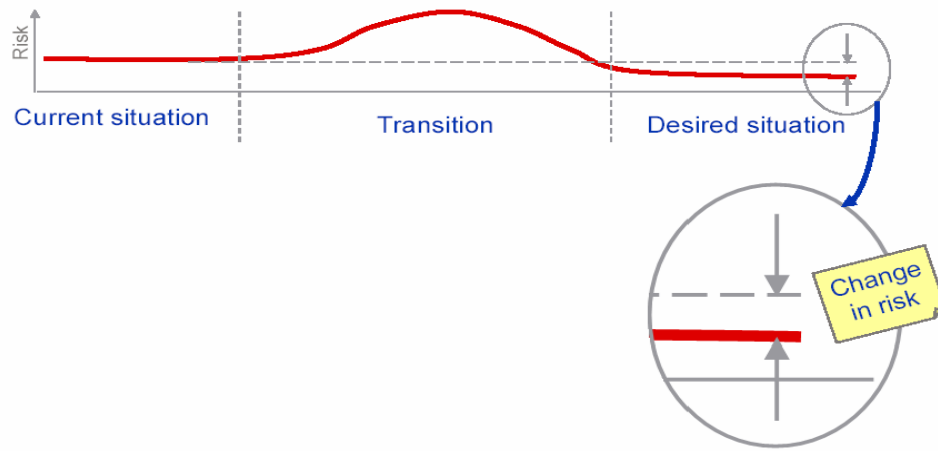


Figure 3 - Transitional Risk

These transition risks are particularly relevant when applied to organizational change. Examples may include :

- Lack of specialist training courses for new working methods
- Conflicting demands on limited resources caused by the need to perform simultaneous tasks
- Distraction of workers by competing demands for time / effort resulting in poor quality of work
- Lack of personal control over workload, resulting in frustration and sub-standard behaviors
- Loss of specific skills and competencies in the new organizational structure
- Lack of time and opportunity to provide any necessary skill training for newcomers to the team
- Failure to capture and preserve essential local knowledge during the transition
- Lack of adequate knowledge, experience, and personnel numbers to handle all emergency situations
- Failure to make lines of communication within the team completely clear
- Failure to recognize needs for advice, help, coaching, etc., following change to organizational structure
- Failure to update or amend operating and emergency procedures properly
- Failure to clarify individual roles and responsibilities resulting in confusion and/or duplication of effort
- Reluctance of leaders to understand stress issues
- Lack of motivation, resulting from change in priorities and conflict in priorities

Another case that may arise during transition to the original change, is that Management may ultimately decide to accept a higher risk level for other perceived and actual beneficial reasons. However, this needs to be very carefully justified.

Once the risk assessment(s) is complete, the report shall be formally reviewed and endorsed as defined by the HCU/OPUs' MOC System.

The Risk Report forms the basis of the Change Proposal as a demonstration that the risks have been identified and assessed, the identified risk controls are approved, and leads the Team into the Planning Stage that follows.