

PETRONAS TECHNICAL STANDARDS
HEALTH, SAFETY AND ENVIRONMENT

Tier 3 HSE ASSURANCE
(GUIDELINE)

PTS 60.0102

JUNE 2006



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(Please note that this standard is based on Shell standard. Essential adaptation to meet PETRONAS specific needs will be done in due course).

Technical Service Department
PETRONAS
August 2004

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JUNE 2006



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HSE MANUAL AMENDMENT RECORD SHEET**PTS Number: 60.0103****PTS Title: MANUAL FOR PETRONAS-LED HSE ASSURANCE**

Chapter No.	Section No.	Description	Issue No.	Date	Revision No.	Date	Approve by : (initial)
All	All	Renumbering to PTS 60.0102 Tier 3 HSE Assurance	1	June 06	1	June 2006	IGA

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FOREWORD

Group-wide requirements covering all types of assurances are defined in the Internal Assurance Guidelines (IAG) (Ref 1) issued by the Corporate Internal Assurance Department.

The objective of this document is to convey the principles and practice of independent PETRONAS-led HSE assurance in an HSE Management System (HSE-MS) context as practised in the PETRONAS Operating Units (OPU/JVs).

This manual provides guidance to lead assessors, assurance team members, assesses and line managers. It provides a methodology for balanced judgement of OPU/JV performance along HSE-MS principles following a structured assessment technique. It is HSE specific and is consistent with the higher level documents in PETRONAS. Generic principles, also applicable to non-HSE assurances, as provided in the higher level documents are repeated in this document where they are considered to underpin the principles.

The structure of this manual will be updated at regular intervals to reflect changes in the PETRONAS role in HSE assurance or practical experience of PETRONAS lead assessors gained whilst conducting assessments.

The contents of this manual may assist OPU/JVs with an internal HSE assurance process along principles similar to PETRONAS-led assurances.

1. RATIONALE FOR INDEPENDENT HSE-MS ASSURANCE

1.1 INTRODUCTION

The PETRONAS Guidelines for General Conduct provides policy guidance covering all Group activity. The PETRONAS HSE policy is outlined as follows:

Quote

'It is the policy of PETRONAS to:

- conduct their activities in such a way as to take foremost account of the health and safety of their employees and of other persons, and
- give proper regard to the conservation of the environment.

PETRONAS pursue a policy of continuous improvement in the measures taken to protect the health, safety and environment of those who may be affected by their activities.

PETRONAS establish health, safety and environmental practices and integrate them in a commercially sound manner into each business as an essential element of management'. Unquote.

In order to comply with the above and other policy elements, specific responsibilities have been delegated to the managers of the individual OPU/JVs. The introduction to Business Control Guidelines (Ref. 2) states:

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'It is the responsibility of chief executives and managers in PETRONAS Group of Companies to establish, maintain, operate and demonstrate an appropriate framework of business controls. The framework should cover all activities of a company, whether operational, technical, commercial, financial or administrative'.

1.2 PURPOSE OF HSE ASSURANCE

With reference to the above, assurance is a structured and independent means to demonstrate that the required business controls framework is appropriate and effective. The purpose of HSE assurance is:

'to provide OPU/JV management a systematic and independent assessment of the consistent and effective implementation of the HSE-MS. The HSE assurance process should enable OPU/JV management to ensure that potential or actual flaws are remedied through effective follow-up action. Corporate HSE will monitor this and may insist that follow-up action is completed or improved where necessary.'

1.3 OBJECTIVE OF PETRONAS-LED ASSURANCE

Appendix 1 further outlines the role of the OPU/JVs in independent HSE assurance as follows:

'PETRONAS will expect OPU/JVs' assurance programmes to include independent HSE assurance.'

'OPU/JVs will usually engage CHSE assurance department to conduct independent HSEMS assurance.'

'OPU/JVs too small for effective internal assurance shall make use of independent assessors.'

Independent has been used here to mean an HSE assurance of an OPU/JV carried out by a body external to the OPU/JV. In the PETRONAS environment it covers OPU/JV assurance led by either PETRONAS (functional internal audit) or by a non-PETRONAS Group organisation (external audit). Conducting has been used here to mean leading the assessments.

Thus it follows that the objective of PETRONAS-led HSE assurance is to provide independent assurance to OPU/JV management to enable them to demonstrate to shareholders that the HSE aspects of a company's activity (or a defined part of that activity) are adequately managed. Appendix 1 states:

'These assurances provide independent verification of the effectiveness of the OPU/JV HSE-MS, including internal HSE assurance, and the strength of the framework of control.'

'The report shall provide an overall rating of HSE controls against specific standards using a defined technique'.

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'The report shall identify significant deficiencies against standards, and recommendations shall be as specific as the team allows.'

'Specificity and transparency of the audit will be the key.'

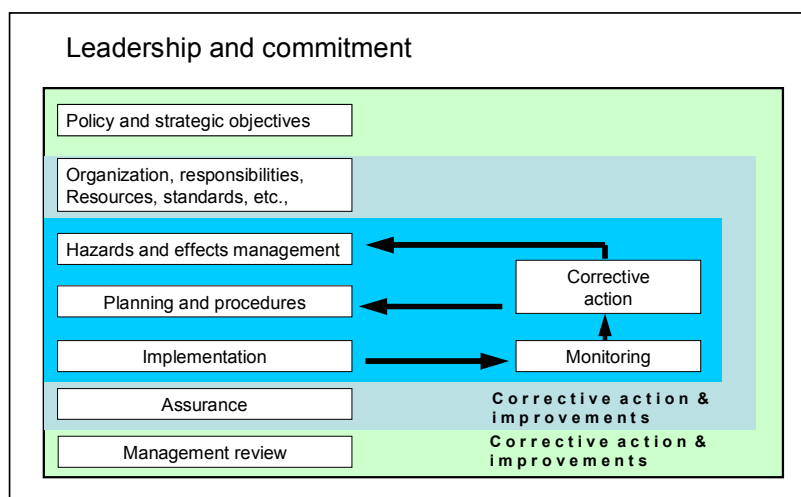
1.4 BUSINESS CONTROLS AND HSE-MS ASSURANCE

Quality management principles demand that business controls are integrated within a management system, and that correct operation of the system is verified by audit.

The required HSE Management System (HSE-MS) is defined in PTS 60.0101, Group Health Safety and Environment Management System Manual. The HSE-MS incorporates the generic controls and provides specific detail and focus on HSE aspects, including the Hazard and Effects Management Process (HEMP). An HSE-MS in its highest-level overview can be illustrated as follows:

Deleted: 2

HSE Management System



HSE-MS assurances are an integral part of this system and assess the effectiveness of the application of this system.

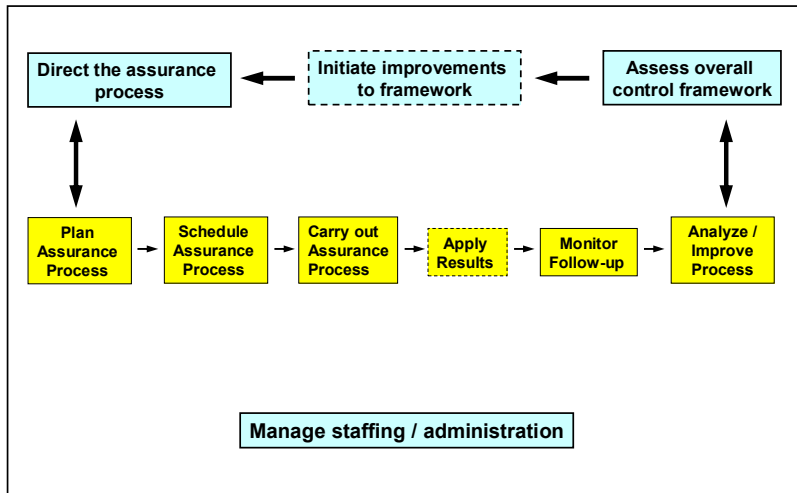
The following chapters will define the methodology and procedures for PETRONAS-led HSE assurance in HSE-MS context.

2. THE INTERNAL ASSURANCE PROCESS

PETRONAS-led assurances are part of the OPU/JV Internal Assurance (IA) process.

The IA process is applicable to all types of assurances, including HSE Assurance, irrespective of whether these are OPU/JV led assessments or independent assessments led by PETRONAS staff. The IAPM is represented as follows:

Internal Assurance Process Model



In this diagram, activities in boxes with dashed borders are not strictly part of the IA process. However, as these activities are routinely reviewed as part of HSE assurance scopes they are included to provide overview and to illustrate interfaces with other processes.

3. DIRECT THE ASSURANCE PROCESS

Direction of the OPU/JV assurance process is the responsibility of the Internal Assurance Board Committee (IABC), the composition of which is determined by the OPU/JV. The role of the IABC, defined in the IAG (Ref. 1), relates to all types of assurance including financial, commercial and technical. The Internal Assurance and HSE Managers normally attend the IABC.

Fundamental to directing the assurance process is the production and maintenance of adequate assurance guidelines - which include standards and procedures - and ensuring their effective application. Each OPU/JV determines its own internal HSE assurance guidelines, which is consistent with PETRONAS Group guidelines and should include the following as a minimum:

- mission and vision statements for HSE, including assurance,
- required strategic development direction of HSE assurance,
- types of assurance to be conducted,
- minimum frequency for each type of assurance,
- duration range for each type of assurance,

- requirements for evaluation and assessment and
- requirements for follow-up of assurance recommendations.

As a further element of the assurance direction process, PETRONAS will expect OPU/JV assurance programmes to include independent HSE assurance. Appendix 1 states:

'Independent assurance shall verify the internal HSE assurance process, testing reports, working files and implementation control, with sufficient sampling of operations to test effectiveness.'

As such:

'OPU/JV assurance guidelines will identify the proportion of the total HSE assurances to be independent assurances, within the business guidelines.'

'The Corporate Health Safety & Environment Committee will monitor that OPU/JVs have a structured programme for HSE assurance in place.'

The OPU/JV internal HSE assurance guidelines need to be updated from time to time in light of changes in risks or risk acceptance criteria resulting from changing internal and external forces which include legislation and technological development.

Also included within the assurance directing process is final approval of the annual OPU/JV assurance plan, the formulation of which is covered in the Chapter 4.

4. PLAN ASSURANCES

4.1 HSE ASSURANCE PHILOSOPHY AND PROGRAMME

The IAG (Ref. 1) requires that each OPU/JV develop an assurance programme to cover all processes within a five-year cycle. For PETRONAS OPU/JVs, about half of the total process elements are considered to be HSE-critical and should be subject to HSE assurance. The portion of HSE-critical process elements varies from around 70% for key asset management and related execution processes to less than 10% for support processes. OPU/JVs should structure their HSE assurance programme in a manner which demonstrably covers all HSE-critical processes. Appendix 1 states:

'In many OPU/JVs a formal HSE-MS with HSE Cases for critical activities is the mechanism for such identification and control of risk and HSE assurance is an important part of any HSE-MS.'

An assurance philosophy along HSE risk-based criteria will provide the basis for an effective and efficient assurance programme. In developing a risk-based assurance programme - what assurance should be performed, why and when - HSE-MS and HSE Case documentation should serve as a key reference. These should provide a comprehensive listing of processes, events and activities which are considered

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critical to the OPU/JV in terms of health, safety and environmental risk.

It is recognised that many OPUs/JV are yet to develop their assurance philosophy in full along HSE risk-based criteria.

4.2 FREQUENCY OF HSE ASSURANCE

Frequency definition for of each type of HSE assurance is an OPU/JV responsibility and the frequencies should be specified in the OPU/JV HSE Assurance Guidelines. As a guideline, Appendix 1 states:

'All business processes should be periodically assessed, and the frequency and depth of HSE assurance of a particular activity should be appropriate for the degree of potential risk.

Only OPU/JV management can fully assess their local circumstances and select the appropriate frequency and depth of assurance appropriate for each activity. This selection shall be formal and transparent, and shall be regularly reviewed to take account of experience of incidents and changes in the OPU/JV's environment. An assurance cycle should not be longer than five years as in that time major changes may have taken place and the consequences for the integrity of the control framework need to be verified.'

In following the above, the frequency at which individual processes or assets are assessed should be subject to the degree of HSE risk, the criticality of the process in relation to the business objectives and the perceived degree of control of that process. As such, even well controlled processes or well managed assets may need to be assessed more frequently than once every five years.

4.3 STANDARD HSE ASSURANCE PACKAGES

The following standard HSE assurance packages have been developed:

- Facility Operations HSE assurances,
- Facility Start-up HSE assurances,
- Seismic HSE assurances,
- Drilling HSE assurances,
- Environmental assurances and
- Occupational Health assurances

These standard types of assurance focus on the HSE-critical activities indicated as:



The sequential driver activity “Produce” is individually assessed by facilities assurances. Other sequential driver activities i.e. Explore, Appraise, Develop and Abandon, are assessed by assurances of the recurrent execution activities as follows:

- Drilling and Well Operations as Drilling Assurances.
- Survey Operations as Seismic Assurances.
- Facility Design and Construction as Start Up Assurances

Abandonment should be subject to an environmental assurance. Air operations are subject to assurance by PETRONAS.

The standard packages provide for common assurance methodology and scope along approved PETRONAS Group guidelines. Reference is made to Appendix 2 for a scope description of these assurance types.

The first four of the above assurances types are structured to provide comprehensive coverage of all elements of the HSE-MS; their scope includes detailed reference to HSE Case documentation or risk analysis material already available within the OPU/JV.

The separate Occupational Health and Environmental assurances are aimed at OPU-wide management. These require PETRONAS specialist skills additional to the level normally provided in conducting the first four assurance types.

All assurances, regardless of being OPU/JV or PETRONAS-led, are essentially review processes of the OPU/JV business controls to establish that they are applied, effectively and efficiently, and comply with OPU/JV requirements. For HSE assurances, it is essential to verify that all risks have been identified, adequate controls have been identified and that controls are complied with. Given the inevitably wide scope and limited duration of PETRONAS-led HSE assurances, this verification will be done via sampling as detailed verification of all the risk elements of the assessed facility or activity cannot be achieved. As such the PETRONAS-led assurances focus on:

- verification that structured risk assessment has been applied to the key HSE risk elements of the facility or activity,

- sample whether these risks have been appropriately assessed and the correct controls have been identified, and
- sample whether these controls have been adequately implemented and complied with.

By limiting the assurance scope, the sampling can be improved thus the verification can be done more thoroughly.

The standard assurance packages provide guidelines to meet these principle objectives in which compliance observations are the key towards conclusions on adequacy of controls. Where possible PETRONAS-led assurances will attempt to identify root causes for the observed deficiencies.

The packages are OPU/JV independent and, with reference to Chapter 6, the contents will require some tailoring to fit the defined scope for individual OPU/JV assurances.

In addition to the above, on OPU/JV request, PETRONAS will provide HSE assurance services as related to miscellaneous OPU specific activity or theme assurances, such as:

- Transport assurances,
- Emergency Response assurances,
- HSE management of contractors assurances,
- Permit To Work assurances and
- HSE training assurances

Whereas these are covered in considerable depth in the first four of the above standard packages, OPU/JV specific circumstances may occasionally justify a more concentrated assessment in dedicated assurances. The scope definition for these assurances will invariably require more dialogue between the OPU/JV and assigned PETRONAS lead assessors when compared to the standard packages.

4.4 FORMULATION OF HSE ASSURANCE PLANS

HSE assurance plans should be prepared as integral elements of the OPU/JV annual business planning cycle. The timing of individual HSE assurances should be determined and prioritised by the OPU/JV's IA Department in consultation with HSE and line managers and potential assessee, taking account of risk criteria and any new or revised business objectives. The typical five-year cycle assurance plans should identify:

Year 1 : precise assurance scope, outline terms of reference and timing of assurances

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Year 2 : outline scope and quarterly phasing for Year 2

Year 3-5 : categories / titles per year.

There should be demonstrable continuity in each annual update of the five-year plan. It is at this stage that an OPU/JV, within its business guidelines, will determine which of the planned HSE assurances will be PETRONAS-led. Appendix 1 states:

'Having established the total long term assurance plan, the OPU/JV should identify the proportion to be independent assurances as opposed to internal assurances, within such guidelines as may be issued by the Business Sector Committee.'

After agreement, the plans for PETRONAS-led HSE assurances should be submitted to Corporate HSE Unit for resource planning and execution scheduling within the overall PETRONAS independent HSE assurance programme. Timing of plan submissions should be in accordance with the PETRONAS planning cycle, the details of which are communicated to each OPU/JV at the appropriate juncture in the cycle. Plans for PETRONAS-led HSE assurances must be firmed-up in advance of the commencement of Year 1.

Corporate HSE Unit should then nominate a leader for each assurance identified as PETRONAS-led HSE assurance (refer to Chapter 12).

4.5 DURATION OF HSE ASSURANCES

Duration is determined by the assurance scope, the principles of team building, OPU/JV participation for ownership and the need to present a report on site. With reference to the scope typically covered in the standard assurance packages as per Chapter 4.3 above, experience has led to the following recommended standards for PETRONAS-led assurances:

- Facilities assurances - 16-18 days
- Start-up assurances - 14-16 days
- Activity assurances - 12-18 days
- Environmental assurances - 12-14 days
- Drilling assurances - 10-14 days
- Seismic assurances - 8-10 days
- Occupational Health assurances - 7-12 days

OPU/JV plans for PETRONAS-led assurances should be based on these durations whereas the precise duration of each assurance is determined as part of the detailed scheduling process of the individual assurances. Deviations from these guidelines

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