

PETRONAS TECHNICAL STANDARDS

HEALTH, SAFETY AND ENVIRONMENT

PETRONAS Group Guidelines for Permit to Work System

PTS 60.2001

Rev 5

September 2008



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/Divisions 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 standardisation.

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

When Contractors or Manufacturers/Suppliers use PTS they shall be solely responsible for the quality of work and the attainment of the required design and engineering standards. In particular, for those requirements not specifically covered, the Principal will expect them to follow those design and engineering practices which will achieve the same level of integrity as reflected in the PTS. If in doubt, the Contractor or Manufacturer/Supplier shall, without detracting from his own responsibility, consult the Principal or its technical advisor.

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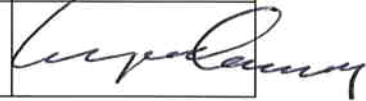
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PTS Updates/Review

This revision of **PTS 60.2001 - PETRONAS Group Guidelines for Permit to Work System** has been updated incorporating the requirements from the PTS 60.2117 Energy Isolation Standard, iPOCS_BPSCE_v1.0 - Bypassing of Safety Critical Equipment and the comments/inputs from OPU's during the PTW Implementation Review Workshop. All updates in the document are highlighted in *italic* font.

The previous version of this PTS (**Revision 4, March 2007**) will be removed from PTS binder/ e-repository from herein onwards.

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1.0 SCOPE

This guidelines is applicable to all PETRONAS Group of Companies and subsidiaries.

2.0 OBJECTIVES

This guidelines provides minimum standards and requirements on PETRONAS Group Permit To Work (PTW) System and OPU's are encouraged to adopt a higher standards where applicable.

3.0 DEFINITIONS

Permit:

Written and signed statement by an authorized person for work to be carried out under stated precautions.

Certificate:

Written and signed statement that specified checks or tests have been carried out by an authorized person and that conditions are acceptable. Certificates do not replaced the PTW but are complementary.

Worksite Preparations / Precautions :

A list of control measures to be taken before and/or during the work covered by the PTW.

Permit Applicant :

The person who applies for the permit e.g. the foreman/ supervisor responsible for planning and execution of the work. The permit applicant can also be the Receiving Authority (RA). The Permit Applicant shall be responsible for the following:

- discusses work with Work Leader (WL) and Approving Authority (AA)
- specifies location and work description
- specifies tools and equipment
- specifies known hazards and hazardous activities

Work Leader (WL) :

The person who leads or carries out the work:

- confirms conditions of permit and agreement by signing
- explains Job Safety Analysis (JSA) content and PTW conditions to workers
- supervises and is at site at all times
- ensures no deviation to permit conditions
- returns permit to Receiving Authority (RA)

Approving Authority (AA):

The person authorized by the OPU to approve and issue PTW in the area concerned. Work involving increased / unusual hazards (e.g. Open fire, hot tapping, entry to confined space etc.) shall require review and authorization at a higher level in the organization. His/her responsibilities among others includes:

- assign Authorised Gas Tester and other required competent persons
- approves/revalidates permit
- receives permit handback
- specifies controls/precautions for safe work
- specifies other certificates

Areas of the plants assigned to the Approving Authority (AA) shall be clearly defined to ensure clear boundary of authority is set covering all areas of the plants. There shall be no overlap between area authority. Where a permit is required to cover work in more than one area it shall be approved by all of the respective Approving Authority (AA).

Approving Authority Representative (AAR) :

The person authorised by the Approving Authority (AA) to carry out safety precautions prescribed in the permits/certificates prior to commencement of work.

Authorized Gas Tester (AGT) :

A person who is trained to meet the requirements of Department of Occupational Safety and Health (DOSH) Code of Practice for safe working in a confined space and industry practices on gas testing, and is authorized by the OPU to issue gas test certificates. If different tests are used, the authorization may be specific to the type of test.

Approving Authority for certificates:

A person authorized by the OPU to approve and issue specific certificates, such as electrical isolation, excavation certificates, etc.

Receiving Authority (RA) :

A person authorized by the OPU to receive approved permits and shall be responsible for supervising the execution of the work by Work Leaders as per the precautions in the permit. The Receiving Authority (RA) can also be the Work Leader(WL). The Receiving Authority (RA) shall also specify controls for safe work and requirements of other certificates.

Receiving Authority Representative (RAR) :

The person authorised by the Receiving Authority (RA) to ensure all the safety precautions prescribed in the permits/certificates are carried out prior to commencement of work.

Operating Unit (OPU) :

The corporate entity having legal responsibility for the work carried out in the operating facility.

Job Safety Analysis (JSA) :

Job Safety Analysis (JSA) is the application of the hazards and effects management process at the task level, identifying and assessing the hazards of each element of the task and defining appropriate controls and recovery measures. This methodology is derived from the work study technique known as Task Analysis and is known variously as Job Hazard Analysis (JHA), Work Safety and Health Analysis and Activity Risk Assessment (ARA).

Reference : PTS 60.151- Job Hazard Analysis

Hot Work :

Hot work is any work where heat is used and generated.

Example of hot work are :

- Welding, flame cutting, grinding, grit/sandblasting, etc (positive ignition sources)
- any work which may generate incentive sparks or other sources of ignition e.g. taking of photograph using camera with flash, use of non-intrinsically safe equipment, including opening of junction boxes etc (potential ignition sources).

Cold Work :

Any work other than hot work defined above.

Example of cold work :

- Erect/dismantle of scaffolding
- Housekeeping etc.

Confined Space :

Confined space means any enclosed or partially enclosed space, either above or below ground or deck level, where entry is possible and where accumulation of dust or gases which are flammable or hazardous to health.

Examples of confined space are:

- Process vessels and related equipment (vessel tower skirt and flare stacks), boilers, cooling tower, pipe, storage tanks, ISO container, other tanks including pontoon in floating roof tanks, tank cars and trucks;
- Spaces located below ground or deck level, such as drain pits, sewage pits and associated tunnels, ducts, trenches, wells, shafts, cellars, vaults and unventilated rooms which may be considered confined space under specific circumstances;
- The cargo, ballast or void space onboard ship;
- The support columns/ legs/ pontoons of fixed or mobile off-shore installations.

Reference : PTS 60.2105 - Entry Into Confined Space

Hazardous Zone Classification:

Zone 0 - That part of a hazardous area in which a flammable atmosphere is continuously present or present for a long period

Zone 1 - That part of a hazardous area in which a flammable atmosphere is likely to occur in normal operation

Zone 2 - That part of a hazardous area in which a flammable atmosphere is not likely to occur in normal operation and if it occurs will exist only for a short period

Process Area :

The boundary/fence line of the process plant area as defined by respective operating plants

Safety Integrity Level (SIL):

A relative level of risk-reduction provided by a safety function, or to specify a target level of risk reduction. In simple terms, SIL is a measurement of performance required for a Safety Instrumented Function (SIF).

4.0 REFERENCE

- PTS 60.151- Job Hazard Analysis
- PTS 60.2102 - Recommendation For Electrical Safety
- PTS 60.2105 - Entry Into Confined Space
- PTS 60.2110 - Working in Inert Space
- PTS 60.2117 - Energy Isolation Standard
- PTS 60.107 - Radiography Safety & Emergency Procedure
- DOSH Code of Practice for safe working in a confined space
- IP Model Code of Safe Practice Part 15 - Area Classification Code for Installations Handling Flammable Fluids
- PTS 20.084 - Hazardous Area Classification
- iPOCS_BPSCE_v1.0 - Bypassing of Safety Critical Equipment

5.0 INTRODUCTION

- 5.1 PETRONAS' Permit To Work system is a major control for safe operations in the oil, gas and petrochemical businesses. This PTW system shall be used for safe operating practice across the Group. This system is not intended to replace existing procedures in JVCs that achieve the same standard.
- 5.2 In countries where PTW system is governed by statutory regulations or national codes of practice, these must be complied with. Where the requirements in this Guidelines and national regulations differ, the more stringent requirements shall be adopted.

6.0 GENERAL REQUIREMENTS

- 6.1 The PTW system is intended to reduce the chance of misunderstanding when work is to be carried out in an operating facility. The term "operating facility", shall be given a wide interpretation including, but not limited to, installations, manufacturing plants, pipelines, exploration and production platforms, depots, warehouses, workshops, laboratories, buildings, tankers, jetties, construction sites and retail outlets.
- 6.2 The PTW is a written document authorizing persons to carry out the work concerned, warning them of possible hazards and spelling out precautions needed for the job to be done safely.
- 6.3 The PTW will aid in the identification and control of hazards, but will not by itself makes the work safe. This can only be achieved by those doing the work. The PTW however, ensures that proper consideration is given to the risks and that they are dealt with prior to commencing the work. The objectives are:-
- i. to ensure proper authorization for non-routine work,
 - ii. to make clear to the person(s) carrying out the work of risks involved and precautions to be taken,
 - iii. to ensure that the person responsible for an operating facility is aware of all work being carried out in the facility,
 - iv. to provide a record showing that the method of work and the precautions needed have been checked by an appropriate person, and if deemed necessary, to ensure a second opinion is obtained to prevent errors of judgement or the taking of short-cuts which may increase risk.
 - v. to use it as a mean of communication within the group of operation, maintenance and contractors and other involved/interested parties.
- 6.4 The same PTW system shall be used whether the person doing the work is a contractor or an OPU staff member. Where the work is to be done by a contractor, the OPU shall ensure that contractors and their employees are trained, informed and comply with the PTW system.
- 6.5 The PTW is intended primarily to safeguard people and property, but it may also be needed as evidence in case of claims against the Company or other legal actions.

7.0 RESPONSIBILITIES

It is the responsibility of each individual identified in this standard to carry out the required actions stipulated. The essential responsibilities for complying with the requirements of this standard are as stated in the following sub-sections.

7.1 Plant / Facility Manager

Plant / Facility Manager shall:

- implement the PTW System in his respective plant or facility.
- ensure that all personnel who operate and use the PTW system are trained and are competent
- nominate and ensure sufficient numbers of trained personnel to carry out the specific duties as required in the PTW System namely as the Authorising Authority (AA), Receiving Authority (RA), Permit Applicant, Receiving Authority Representative (RAR), Approving Authority Representative (AAR) and the Authorised Gas Tester (AGT).
- formalise the appointment of personnel assigned to the duties as Authorising Authority (AA), Receiving Authority (RA) by official Letter of Appointment
- ensure that Contractors working in OPU operations nominate key personnel for the duties of the Receiving Authority (RA) and Work Leader if applicable.
- monitor and ensure that the PTW system is effective.

7.2 Contractor's Management

Contractor's Management shall ensure all their employees:

- understands the OPU's PTW System
- are trained to receive and supervise work under a PTW system
- are qualified and competent to execute the respective duties for which they are employed

Contractor's Management shall assure the performance of their employees with regards to PTW on:

- their understanding (roles and responsibilities)
- their work practices

7.3 Approving Authority (AA)

This person has authority and responsibility for the overall implementation of safe management of work activities for which he issues the permit. Before signing the PTW form to authorise work, he should verify and satisfy himself that:

- he understands the nature of the work being applied for, all the hazards associated with the job are identified and the risk has been reduced to as low as reasonably practicable (ALARP)
- the work being authorised does not jeopardise ongoing operations of the facility
- assign Approving Authority Representative (AAR) to prepare all the necessary precautions required, before work begins are being verified to be in place, monitor work progress and compliance to PTW
- other permits (jobs) ongoing do not conflict with the permit for the work that he is issuing and permits for tasks that may interact with other permit/activities are cross-referenced
- all supporting certificates and documents that will enhance information and add-value to the safe execution of the work are attached and made known to all concerned parties carrying out the work
- all required equipment and PPE are adequate to carry out the work safely
- the Receiving Authority (RA) is competent and is able to understand the conditions stipulated in the PTW form and other supporting Certificates (if required) and that these are conveyed as necessary to other personnel involved with the work and under his control
- all people who may be affected by the work are informed before the work begins, when the work is suspended and when the work is completed
- that effective organisation exists to ensure that the work site to be examined before work begins, on completion of work and when work is suspended
- sufficient time is spent on shift/crew hand over to discuss all ongoing or suspended permits with the incoming permit Approving Authority (AA)
- joint site visit and verification are conducted by Approving Authority Representative (AAR) and Work Leader (WL) or Receiving Authority Representative (RAR) prior to approval of PTW

7.4 Receiving Authority (RA)

Receiving Authority (RA) shall ensure that:

- They have received PTW training, assessed and authorised as Receiving Authority (RA)
- The people working for them have received adequate training/instruction in PTW system
- They discuss the job fully with Approving Authority (AA)
- The permit/certificate is posted at work site
- The work party is briefed on the details of the permit/certificate including any potential hazards, and all the precautions taken or to be taken
- The precautions are maintained throughout the work activity

- The worker understands that if circumstances change, work must be stopped and advice sought
- The work group stays within the limitations set on the permit/certificate (physical boundaries, type of work and validity time)
- On completion or suspension of the work, the site is left in a safe condition and the Approving Authority (AA) is informed.
- If the Receiving Authority (RA) leaves the plant while work is still being done, then he must formally hand over his responsibility to another Receiving Authority (RA). The name and signature of the new Receiving Authority (RA) must then be added to all copies of the PTW and associated certificates.

7.5 Individuals working under the permit/certificate

Individuals working under the permit/certificate including contractors shall ensure that:

- They have received PTW training/instruction and have a good understanding of the PTW system
- They do not start any work requiring a permit/certificate until it has been properly authorised and issued
- They receive a briefing from the Work Leader (WL) on the particular task and they understand the hazards and the precautions taken or to be taken
- They follow the instructions/conditions specified in the permit/certificate
- When they stop work, the site and any equipment they are using is left in a safe condition
- If in doubt, or if circumstances change, they must stop work and consult with their Work Leader (WL)

8.0 PTW APPROACH

A systematic, disciplined approach shall be used for control of all non-routine work in an operating facility. Such an approach includes the following steps:

- i. Specifying the work to be undertaken, the exact location and the equipment to be used, when applying for the PTW.
- ii. Specifying the precautions to be taken, by completing the relevant sections of the PTW.
- iii. Completing preparatory work, including certificates, checking that the worksite is safe and prescribed personal safety precautions have been taken.
- iv. Giving permission for work to start by signing the PTW.
- v. Frequent checking the safety of work in progress, the validity of PTWs and certificates, and the adherence to specified precautions.
- vi. Checking that the worksite has been left in a satisfactory condition upon completion of the work prior to closure of the PTW. The PTW system shall be strictly adhered to.

9.0 PERMITS

9.1 Permits shall be issued for all work across the Group and shall consist of two categories as follows:

- i. Cold Work
- ii. Hot Work

9.2 Apart from the minimum information required about the job to be described by the Permit Applicant and space for authorization by the Approving and Receiving Authorities, it shall contain as a minimum the following sections :-

- i. Section 1 : Requisition
- ii. Section 2 : Hazards/Hazardous Activities
- iii. Section 3 : Worksite Preparation/Precautions
- iv. Section 4 : Personal Protective Equipment

- v. Section 5 : Supporting Certificates/Documents
- vi. Section 6 : Joint Site Visit Before Work Start/Approval
- vii. Section 7 : Revalidation
- viii. Section 8 : Handback

- 9.3 If the work is complex (affecting more than one area of responsibility; e.g. certain electrical jobs) or involves additional hazards (e.g. Hot tapping or entry into confined spaces), multiple permits, additional certificates and/or additional signatures shall be required.
- 9.4 For any work that require a gas test to be carried out eg. entry into a confined space (i.e. safe atmosphere for breathing) or to undertake hot work (i.e. atmosphere free from flammable vapour), Authorised Gas Tester (AGT) must record the test results and sign the "Gas Test Results" section after conducting the gas tests at site at a frequency appropriate to the risk.

The following requirements/conditions shall be fully complied during gas testing:

Gas Tests	Working in a Confined Space	Working outside a Confined Space
Oxygen	20% to 20.9%	20% to 20.9%
Combustible	< 1% LEL	< 10% LEL
Toxic	< 50% PEL	< PEL

Under exceptional circumstances when the level of above specified gas concentration cannot be attained, risk assessment is required to be carried out and additional precautionary measures including use of SCBA, supplied airline, etc. should be put in place before work can commence.

- 9.5 Permit Validity (Life)
The maximum validity of any single permit shall be as follows:
Cold Work 7 consecutive days but with revalidation at each shift
Hot Work..... 7 consecutive days but with revalidation at each shift
Confined Space..... 7 consecutive days but with revalidation at each shift
- 9.6 Permits revalidation shall follow similar process as Permit Application (12.1 Permit Application & Site Preparation)

10.0 CERTIFICATES

There are two types of certificates being used for Permit to Work System namely Normal Certificate and Special Certificate. Examples of Special Certificate are Electrical Isolation Certificate, Physical Isolation Certificate and Safety System Bypass / Override Certificate.

All certificates are used as part of the Permit to Work System. For Normal Certificate the maximum validity/life period is seven days whereas for Special Certificate the maximum validity/life period could be extended to the maximum period of three (3) months. The Special Certificate is required to be revalidated every seven (7) days.

Under the following circumstances/conditions the validity/life of Special Certificate could be extended more than seven (7) days with a maximum period of three (3) months (revalidation is required every seven (7) days):

1. Works that require more than seven (7) days to complete and Special Certificate is required to support the works. When the work permit expire after seven (7) days, new permit shall be issued for the same works but the Special Certificate will continue to be valid until a maximum period of three (3) months. Revalidation of the Special Certificate is required every seven (7) days within this period.

2. In cases of late delivery of spare part(s) or any other reason resulting in work(s) specified in Permit to Work cannot be completed within seven (7) days. When the work permit