

PETRONAS TECHNICAL STANDARDS

DESIGN AND ENGINEERING PRACTICE

MANUAL

MINIMUM REQUIREMENTS FOR IMPLEMENTATION OF NON-ROUTINE CRITICAL ACTIVITIES

PTS 31.00.10.10

MARCH 2009



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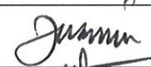
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This revision of PTS **31.00.10.10 – Minimum Requirements for Implementation of Non-Routine Critical Activities** has been updated incorporating PETRONAS Lessons Learnt, Best Practice and new information issued by relevant industry code and standards. All updates in the document are highlighted in *italic* font.

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

Document Approval

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Revision History

Date	Version	Description of Updates	Author
31/03/09	1	The PTS title has been changed from 5 digit series to 8 digit series. This PTS also has been reviewed / updated. All updates in the document are highlighted in <i>italic</i> font.	Mohd Hilmi Bin Zainal Abidin

PREFACE

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

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1.0 INTRODUCTION

1.1 SCOPE

This PTS which gives minimum requirements and recommended guidelines for implementation of the following non-routine critical activities:

- I. On-Line Leak Sealing
- II. Hot Tapping & Line Stoppling
- III. Hydro Jetting & Hydro Cutting
- IV. Critical Lifting
- V. On-line Safety Valve Testing
- VI. Hot Bolting

It is intended to be used as a guideline to establish safe work practices and to ensure that the associated risk is managed to “As Low As Reasonably Practicable” (ALARP).

1.2 DISTRIBUTION, INTENDED USE AND REGULATORY CONSIDERATIONS

Unless otherwise authorized by PETRONAS, the distribution of this PTS is confined to companies forming part of PETRONAS group and to Contractors nominated by them.

This PTS is intended for use in oil refineries, chemical plants, gas plants, pipelines and supply/ marketing installations, and where applicable, onshore exploration and production facilities.

If national and/ or local regulations exist in which some of the requirements may be more stringent than in this PTS, the Contractor shall determine by careful scrutiny which of the requirements are the more stringent and which combination of requirements will be acceptable as regards safety, economic and legal aspects. In all cases the Contractor shall inform the Principal of any deviation from the requirements of this PTS which is considered to be necessary in order to comply with national and/ or local regulations. The Principal will decide the best course of action.

1.3 DEFINITIONS

1.3.1 General Definitions

The **Contractor** is the party which carries out all or part of the design, engineering, procurement, construction, commissioning or management of a project or operation of a facility. The Principal may undertake all or part of the duties of the Contractor.

The **Manufacturer/Supplier** is the party which manufactures or supplies equipment and services to perform the duties supplied by the Contractor.

The **Principal** is the party which initiates, and ultimately pays for, the project. The Principal will generally specify the technical requirements. The Principal may also include an agent or consultant, authorized to act for the Principal.

The word **shall** indicate a requirement.

The word **should** indicate a recommendation.

1.3.2 Specific Definitions

Clamp	Device specifically design to perform leak sealing
Critical lifting	Any lifting which falls under the following category: I. Weight of panel to be lifted $\geq$ 80% of SWL II. Complexity of lifting arrangement e.g. lifting which involve more than 1 crane III. Lifting over life equipment IV. Lifting over electrical equipment
Garnet	Hard, vitreous minerals, silicates of calcium, magnesium, iron or manganese with aluminum or iron used as an abrasive
Hot Bolting	Removal and reinstatement of studs and nuts from a weld neck flange while the line is still in service
Hot-tapping	A method of making connection to piping (or other equipment) by attaching a fitting to the system, usually by welding, followed by cutting through the pipe wall at the point of attachment utilising an appropriate ("hot-tapping") machine. This operation is generally carried out on a live ("hot") system without decommissioning or interrupting flow
Hydro cutting	An application of hydro jet principle where it is used to cut through certain materials
Hydro jets	A pump-jet or water jet system that creates a jet of water for propulsion
Leak Sealing	A process of containing pressurized leak
Lifting	Process of moving loads in vertical mode
Lifting Gear	Item used to connect a load to a lifting machine that is not capable of providing any movement to lift or lower the load on its own
Lifting Machinery	Any machine which is able to raise, lower, suspend or move a load including its attachments for anchoring, fixing, or supporting it
Maximum Load Limit	Maximum load or mass that an item of lifting gear is designed to raise, lower or suspend
Non-routine Critical Activities	Any process that is not a standard daily works or task

Professional Engineer	A person licensed under the law and holds a valid certificate of registration
Rigging	Correct placement of tools and accessories for the purpose of moving or lifting heavy loads
Safe Working Load	Working load that shall not be exceeded
Safety Valve Testing	Process of testing Pressure Safety Valve/ Pressure Relief Device in-situ or at workshop
Slings	Manufactured pieces of equipment to facilitate load lifting and rigging works
Stoppling	A hot-tapping operation which includes the insertion and setting of a sealing plug in the pipe in order to stop flow and withstand a certain fluid pressure

Note: MLL is determined by the manufacturer based on the mechanical properties of the item
SWL is the working maximum load assigned by authority

1.3.3 ABBREVIATIONS

ANSI	American National Standard Institute
API	American Petroleum Institute
ASME	The American Society for Mechanical Engineers
BA	Breathing Apparatus
CHSE	Corporate Health, Safety and Environment
CV	Curriculum Vitae
ERT	Emergency Response Team
GTS	Group Technology Solutions
HSE	Health, Safety and Environment
JSA	Job Safety Analysis
MAWP	Maximum Allowable Working Pressure
MLL	Maximum Load Limit
OPU	Operating Unit
PE	Professional Engineer
PFD/PFS	Process Flow Diagram/Process Flow Scheme
PMA	"Pendaftaran Mesin Angkat"
PPE	Personal Protective Equipment
PSV/ PRD	Pressure Safety Valve/ Pressure Relief Device
PTS	PETRONAS Technical Standards
PTW	Permit to Work
QA/QC	Quality Assurance / Quality Control
SWL	Safe Working Load
TP	Technical Professional
WPS	Welding Procedure Specification