

PETRONAS TECHNICAL STANDARDS

PREPARATION OF PROCESS FLOW SCHEMES AND PROCESS ENGINEERING FLOW SCHEMES

PTS 01.00.02.11

NOVEMBER 2011



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PTS Circular

2011 - 1

PTS No:	01.00.02.11
PTS Title:	PREPARATION OF PROCESS FLOW SCHEMES AND PROCESS ENGINEERING FLOW SCHEMES

This revision of **PTS 01.00.02.11 - Preparation of Process Flow Schemes and Process Engineering Flow Schemes (November 2011, Revision 4)** 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 01.00.02.11 (January, 2009)** will be removed from PTS binder/ e-repository from herein onwards.

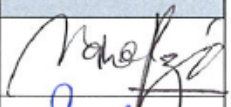
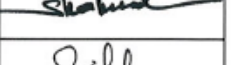
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0			Dec 1996
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2			Feb 2007
3	M Rosdi Naim	Zainab Bt Kayat	Jan 2009
4	M Rizal A Rahman	Zainab By Kayat	Nov 2011

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 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, it is expected of 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 owner.

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The copyright of PTS vests in PETRONAS. Users shall arrange for PTS to be held in safe custody and PETRONAS may at any time require information satisfactory to PETRONAS in order to ascertain how users implement this requirement.

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1. INTRODUCTION

1.1 SCOPE

This PTS specifies requirements and gives recommendations for the preparation of Process Flow Schemes (PFSs) and Process Engineering Flow Schemes (PEFSs). The party responsible for the process design and process engineering design prepares these schemes.

The requirements and recommendations in this PTS are independent of the tools with which the schemes are produced. If a Computer Aided Design (CAD) drafting system is used it shall be compatible with an intelligent drawing and database system and PETRONAS Electronic Document Management System (PEDMS) to be specified by the Principal.

PFSs and PEFSs shall not only be prepared for process units in a narrower sense, but also for utility units and for common facilities where such schemes are appropriate.

This PTS is a revision PTS of the same number dated *January 2009*.

A summary of changes from the previous edition is given in (1.5). In the preparation of this PTS revision, BS EN ISO 10628 was considered; however, it was decided for the time being not to incorporate this external standard due to the large impact this would have on the existing documentation within PETRONAS.

1.2 DISTRIBUTION, INTENDED USE AND REGULATORY CONSIDERATIONS

Unless otherwise authorised by PETRONAS, the distribution of this PTS is confined to companies forming part of the PETRONAS or managed by a Group company, and to Contractors nominated by them (i.e. the distribution code is "C" as defined in PTS 00.00.05.05).

This PTS is intended for use in oil refineries, gas plants and, where applicable, chemical plants, exploration and production facilities and supply/marketing installations. When PTSs are applied, a Management of Change (MOC) process should be implemented. This is of particular importance when existing facilities are to be modified.

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 to safety, environmental, 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 may then negotiate with the authorities concerned with the object of obtaining agreement to follow this PTS as closely as possible.

1.3 DEFINITIONS

The **Contractor** is the party that 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 that manufactures or supplies equipment and services to perform the duties specified by the Contractor.

The **Principal** is the party that initiates the project and ultimately pays for its design and construction. The Principal will generally specify the technical requirements. The Principal may also include an agent or consultant authorised to act for, and on behalf of, the Principal.

The word **shall** indicates a requirement.

The word **should** indicates a recommendation.

1.4 CROSS-REFERENCES

Where cross-references to other parts of this PTS are made, the referenced section number is shown in brackets. Other documents referenced by this PTS are listed in (4).

1.5 REVISION TO PREVIOUS EDITION

The previous edition of this PTS was January 2009. Other than editorial editions, the following are the main changes since that edition:

The followings are the changes made from August 2011 to date

Old section	New Section	Change
2.1	2.1	<i>Added additional information on example of material balance template. Added new 3rd paragraph explaining the importance of decimal placement/format requirement</i>
2.2	2.2	<i>Add the description of "installed spare pump" and indicate that the internals are applicable to column and vessel.</i>
2.4	2.4	<i>Added requirement to identify major and minor flow lines in PFS for the purpose of ease of understanding of process flow</i>
2.4	2.4	<i>Added the line-up from existing plan especially for tie-in work shall be indicated in dotted line to provide better understanding of the connection between existing and new facility.</i>
3.1	3.1	<i>Added additional explanation to explain the purpose of PEFS</i>
3.1	3.1	<i>Added requirement that PEFS shall be updated to actual installation when there are changes made in the field</i>
3.1	3.1	<i>Elaborated layout requirements within a PEFS</i>
3.1	3.1	<i>Requirement added whereby valves and connections to equipment are shown in relative position</i>
3.1	3.1	<i>Added "under culvert" and "expansion loops" to the bullet list for specific engineering requirements to be shown in a PEFS</i>
3.1	3.1	<i>Added a sentence to state that PEFS and P&ID are equivalent terms</i>
3.2	3.2	<i>Requirement to identify equipment by size and capacity was added to the bullet list</i>
3.2	3.2	<i>Guideline added to show sizing information of rupture disc and conventional vent in PEFS.</i>
3.3	3.3	<i>Requirements added to show insulation type and thickness, AG/UG line break, piping specialty items for piping</i>
3.3	3.3	<i>Requirements added to show interlock, any bypass hand switch for IPS, winterization requirements for instrumentation and analyzers.</i>
3.3	3.3	<i>Requirements added to show fail actions and tight shutoff characteristics of automated valves</i>