

PETRONAS TECHNICAL STANDARDS

DESIGN AND ENGINEERING PRACTICE

INSTALLATION OF ROTATING EQUIPMENT (AMENDMENTS/SUPPLEMENTS TO API RP 686)

PTS 31.29.00.10

November 2010



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PTS No:	31.29.00.10
PTS Title:	Installation of Rotating Equipment (Amendment/ Supplement to API RP 686)

This revision of PTS 31.29.00.10– Installation of Rotating Equipment (Amendment/ Supplement to API RP 686) has been updated and has incorporated PETRONAS Lessons Learnt, Best Practice and new information issued by relevant industry code and standards. This PTS is still valid and with editorial changes only.

The previous version of this PTS 31.29.00.10 (November 2003) will be removed from PTS binder/ e-repository from herein onwards.

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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 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.

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.

The right to use PTS rests with three categories of users:

- 1) PETRONAS and its affiliates.
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PART I INTRODUCTION

1.1 SCOPE

This PTS specifies requirements and gives recommendations for the mechanical installation of rotating equipment. This PTS is based on API RP 686, 1st Edition, April 1996; Part III of this PTS amends, supplements and deletes various clauses of API RP 686.

This PTS shall be used by the Contractor to prepare checklists to ensure proper installation of rotating equipment.

This PTS is a revision of an earlier PTS of the same number dated July 1996; a summary of the main changes is given in (I-1.5).

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 or managed by PETRONAS, and to Contractors nominated by them.

This PTS is intended for use in oil refineries, chemical plants, gas plants and, where applicable, 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 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 some of the duties of the Contractor.

The **Manufacturer/Supplier/Vendor** 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 in this PTS are listed in (PART IV).

Where cross-references to API RP 686 are made, the referenced section number is shown in square brackets.

1.5 CHANGES FROM PREVIOUS EDITION

The previous edition of this PTS was dated July 1996. The most significant change has been the closer alignment with API RP 686 and its structure. Due to this restructuring, it is impractical to list the individual changes.

PART II GENERAL INFORMATION

This PTS gives amendments and supplements to API Std 686, Third Edition, September 1996.

Installation of rotating equipment shall be in accordance with API RP 686 as amended/supplemented by this PTS.

For ease of reference, the clause (or paragraph) numbering of API RP 686 has been used throughout Part III of this specification. Clauses (paragraphs) in API RP 686 not mentioned shall remain valid as written.

PART III AMENDMENTS/SUPPLEMENTS TO API 686

2. GENERAL REQUIREMENTS

CHAPTER 2 - RIGGING AND LIFTING

1.3 LIFTING THE MACHINERY

1.3.3 Add

Add to this clause:

Lifting of the baseplate during installation shall be done in accordance with the Manufacturer's instructions to prevent permanent distortion.

CHAPTER 3 - JOBSITE RECEIVING AND PROTECTION

1.3 PRE PLANNING

Add the following new clauses:

1.3.4 Quality Plan

Well in advance of equipment installation, the Contractor shall propose for the approval of the Principal a quality plan detailing all aspects of site reception, preservation, installation, inspection and pre-commissioning of rotating equipment.

Each individual item of equipment shall have its own checklist covering all aspects of preservation, installation, inspection and pre-commissioning.

Such checklist shall ultimately be approved by the rotating equipment department of the Principal or its representative. The completed and signed-off checklists shall be the key documents in the hand-over procedure.

A copy of the completed checklist shall be added to the Equipment Record Card (including installation records, level and alignment data, run-in record, vibration data etc.). Where applicable, these documents shall be in the electronic format used at the particular location. Reference is made to PTS 61.10.08.11 and PTS 70.10.01.10

1.3.5 Construction Tools / Special Tools

It is the Contractor's responsibility to ensure that the correct tools are available and are used for the proper installation of rotating equipment (i.e. stainless steel shims, correct-size spanners and keys, certified slings and chain hoists, torque wrenches, metric alignment dial gauges and calibrated engineering spirit levels, vibration meters, analysers, etc.). Self-made wrenches or adjustable wrenches shall not be used on rotating equipment.

1.3.6 Installation And Operating Manuals

The Manufacturer's installation and operating manuals shall be available at site at least one month prior to installation of the equipment. The instructions contained therein shall be followed unless superseded by more stringent requirements in this PTS.

Shop test and inspection records and records of all "as built" clearances shall be collected and made available at site when the installation commences.

At the time installation starts, completed Equipment Record Cards of all equipment supplied shall be available at site. It shall be specified In the project specification whether Record Cards are required in electronic form or as hard copies.

During installation and commissioning, the Contractor shall add all relevant information to the Equipment Record Cards.

1.3.7 Lubricants

The Contractor shall furnish lubricant recommendations for all rotating equipment of the project in the form of a lubrication manual (schedule), which shall contain the required