

# PETRONAS TECHNICAL STANDARDS

## DESIGN AND ENGINEERING PRACTICE

### STEAM INJECTION SYSTEMS FOR SAFEGUARDING THERMAL CRACKING UNIT

PTS 10.02.51.11  
NOVEMBER 2009



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#### For PTS Updates/Review

This revision of PTS 10.02.51.11– **Steam Injection Systems for Safeguarding Thermal Cracking Units** 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 (**December 1994**) will be removed from PTS binder/ e-repository from herein onwards.

#### Document Approval

|                       | Name                 | Designation                               | Date          | Signature                                                                             |
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#### Revision History

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| Oct 1984 | Revision 0 |                                                                                                                        |        |
| Dec 1994 | Revision 1 |                                                                                                                        |        |
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## 1. INTRODUCTION

### 1.1 SCOPE

This PTS describes the minimum requirements for the design and engineering of the steam injection facilities in various thermal cracking units, for safeguarding their integrity and operation. The purpose of the system is to protect the furnace tubes from coking up during an emergency situation, e.g. In the event of unexpected feed failure. After initiation, the steam-out operation should therefore be fast, reliable and automated.

This PTS is a revision of the publication with the same number dated October 1984. This PTS explains the principles of the steam-out system but it does not cover furnace control systems except where certain control features are necessary for the operation of the steam-out system.

These facilities consist of:

- Automated steam-out facilities for the radiant section coils of both residue and distillate cracking furnaces.
- Barrier-steam injection into furnace outlet lines in units with a soaker, in order to minimize backflow of soaker contents into the furnace if a tube rupture takes place.
- Steam injection upstream and downstream of relief valves, in order to ensure that the relief valves are fully reliable.

This PTS shall be used for all new designs and applied to existing installations if modifications are required. Some design details may need modification to suit the requirements of individual installations.

### 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 PETRONAS group and to Contractors nominated by them. This PTS is intended for use in oil refineries.

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 document 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 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 specified by the Contractor.

The **Principal** is the party which 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 (5).

1.5 SUMMARY OF CHANGES

*This revision has been essentially only editorial, with no technical changes.*