

PETRONAS TECHNICAL STANDARDS

DESIGN AND ENGINEERING PRACTICE

MANUALS

INSTRUMENTATION OF DEPRESSURISING SYSTEMS

PTS 32.45.10.10

NOVEMBER 2009



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This revision of **PTS 32.45.10.10 – Instrumentation of Depressurising Systems** 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 (**November 2003**) will be removed from PTS binder/ e-repository from herein onwards.

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Revision History

Date	Version	Description of Updates	Author

SUMMARY OF CHANGES

Section	Description of Changes
2. GENERAL	Added following clause in Para 2 On Exploration and Production facilities, high rate emergency depressuring system should consist of an on/off actuated ball valve (ABV). For a process system where its components are sensitive to the depressuring rate and/or high noise level exceeding local authority requirements, a restriction orifice (RO) may be used as a rate adjusting device. In the event that the noise level still exceeds local authority requirements with ABV and RO, a control valve should be considered, subject to the approval of the Principal. Added following clause in Para 4 (bold) The implementations for high-rate emergency depressurising systems are primarily distinguished by the use of normally energised or normally de-energised solenoid valves. Normally de-energised solenoids are preferred for depressurizing valves to prevent inadvertent depressurizing, in event of solenoid failure.
3.2.2 Valve requirements	Rephrase item 2 (bold) 2) The valve should have a metal seat and shall be tight shut-off in the forward flow direction in accordance with IEC 60534-4 leakage class V; (the requirement of fire safe valves subject to the approval of the Principal).
4.1.1 System requirements	Rephrase as follows (bold): (1) Starting at the maximum upstream process pressure and the minimum downstream process pressure, the depressurising valve shall stroke from fully closed to fully open and vice versa within 30 s from initiation, when operated from the pneumatic manual station and within 20 s from initiation when electrically operated (2) The manual control station shall be located at a safe and remote location (usually the control room);
6.4 SIGNAL SEGREGATION	Rephrase as follows (bold): Redundant IPS inputs from the 'depressurising' initiating device shall not share the same power supply units, input cards, racks and field and/or system cabling in order to minimise common mode failure.
6.5 SIA BUFFER VESSEL	Following note were removed: Note 2. Air buffer vessels may require a safety relief device, if located in a so-called fire area. (Depending on the size of the buffer vessel it may need ASME certificate to operate as a pressure vessel this is a DOSH requirements)
APPENDIX 1	Added and/or rephrase note 7, 11 and 12 as follows (changes bold): 7. A relief valve on the SIA buffer vessel is only required if located in a so-called fire area or when stipulated by local authority requirement eg DOSH. 11. To improve reliability, followings are options: a) use of dual NE solenoid valves in series using separately routed cable, and segregated outputs from IPS to minimize common mode failure. However, this must be installed with a test panel to execute regular on-

Section	Description of Changes
	line testing to ensure zero solenoid failure on demand. b) use of solenoid valves with dual coils. 12. The depressuring valve(s) shall be provided with two limit switches, one for fully open position and one for fully closed position. SIL Class for the limit switches as the initiators for trip function (if any), shall be done to determine the final configuration (1001, 2003 etc).
APPENDIX 2	Added and/or rephrase note 7, 12 and 14 as follows (changes bold): NOTES: 7. A relief valve on the SIA buffer vessel is only required if located in a so-called fire area or when stipulated by local authority requirement eg DOSH. 12. Input and output circuit fault alarms shall be equipped with line monitoring facilities and be able to distinguish between open circuits, short circuits and earth faults. 14. The depressuring valve(s) shall be provided with two limit switches , one for fully open position and one for fully closed position. SIL Class for the limit switches as the initiators for trip function (if any), shall be done to determine the final configuration (1001, 2003 etc).
APPENDIX 4	Rephrase Note 7 7. A relief valve on the SIA buffer vessel is only required if located in a so-called fire area or when stipulated by local authority requirement eg (DOSH

PREFACE

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The objective is to set the recommended standard for good technical practice to be applied by PETRONAS' OPUs 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.

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1. INTRODUCTION

1.1 SCOPE

This PTS specifies requirements and gives recommendations for the instrumentation of depressurising systems, taking into consideration high-rate emergency depressurising and low-rate operational depressurising.

IPF classification according to PTS 32.80.10.10 defines the implementation and testing requirements for instrumented protective functions, including depressurising systems. Where IPF classification results in more stringent requirements than the typical design arrangements specified in this PTS, the design shall be modified accordingly.

This PTS is a revision of the PTS of the same title and number dated December 1994 and shall be used in conjunction with other PTS documents, particularly PTS 32.31.00.32, PTS 32.36.01.17 and PTS 32.80.10.10.

1.2 DISTRIBUTION, INTENDED USE AND REGULATORY CONSIDERATIONS

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This PTS is intended for use in oil refineries, chemical plants, gas plants, supply/marketing installations and in 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, 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

1.3.1 General definitions

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 **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 Principal may sometimes 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 word **shall** indicate a requirement.

The word **should** indicate a recommendation.