DEP SPECIFICATION

PIPELINE TRANSPORTATION SYSTEMS - PIPELINE VALVES (AMENDMENTS/SUPPLEMENTS TO ISO 14313)

DEP 31.36.00.30-Gen.

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DESIGN AND ENGINEERING PRACTICE

DEM1

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TABLE OF CONTENTS

PART I INTRODUCTION 5
1.1 SCOPE 5
1.2 DISTRIBUTION, INTENDED USE AND REGULATORY CONSIDERATIONS 5
1.3 DEFINITIONS 5
1.4 CROSS-REFERENCES 6
1.5 SUMMARY OF MAIN CHANGES 6
1.6 COMMENTS ON THIS DEP 6
1.7 DUAL UNITS 6

PART II GENERAL 7

PART III AMENDMENTS/SUPPLEMENTS TO ISO 14313 8
6 VALVE TYPES AND CONFIGURATIONS 8
7 DESIGN 9
7.1 DESIGN STANDARDS AND CALCULATIONS 9
7.2 PRESSURE AND TEMPERATURE RATING 9
7.4 FACE-TO-FACE AND END-TO-END DIMENSIONS 10
7.5 VALVE OPERATION 10
7.6 PIGGING 10
7.7 VALVE ENDS 10
7.8 PRESSURE RELIEF 11
7.9 BYPASSES, DRAINS AND VENTS 11
7.10 INJECTION POINTS 12
7.11 DRAIN, VENT AND SEALANT LINES 13
7.12 DRAIN, VENT AND SEALANT VALVES 13
7.13 HAND-WHEELS AND WRENCHES — LEVERS 13
7.18 ACTUATOR, OPERATORS AND STEM EXTENSIONS 14
7.19 LIFTING 14
7.20 DRIVE TRAINS 14
7.21 STEM RETENTION 15
7.22 FIRE TYPE - TESTING 15
7.23 ANTI-STATIC DEVICE 15
7.26 SECURING 16
7.27 SEAT RINGS 16
7.28 SEALING RINGS 16
7.29 STUFFING BOX, GLAND AND PACKING 16
7.30 FUGITIVE EMISSIONS TIGHTNESS CLASSIFICATION 17
7.31 DESIGN VALIDATION TESTING 17
8 MATERIALS 17
8.1 MATERIAL SPECIFICATION 17
8.2 SERVICE COMPATIBILITY 17
8.3 FORGED PARTS 18
8.4 COMPOSITION LIMITS 18
8.5 TOUGHNESS TEST REQUIREMENTS 18
8.6 BOLTING 18
8.9 HEAT TREATMENT 18
9 WELDING 18
9.2 IMPACT TESTING 18
9.3 HARDNESS TESTING 19
9.4 REPAIR 19
9.5 WELDING AND HARD FACING REQUIREMENTS 19
10 QUALITY CONTROL 20
10.1 NDE REQUIREMENTS 20
10.5 WELD END NDE 20
10.6 VISUAL INSPECTION 20
10.7 CORROSION TESTING 20
10.8 MICROSTRUCTURE DETERMINATION 20
11 PRESSURE TESTING 20
11.3 HYDROSTATIC SHELL TEST 20

Documents
Document Sharing Hub

Full document details: SHELL 31.36.00.30 2012

11.4 HYDROSTATIC SEAT TEST....20
11.5 TESTING OF DRAIN, VENT AND SEALANT INJECTION LINES....21
11.7 LOW-PRESSURE GAS SEAT TEST....21
12 COATING....21
13 MARKING....21
14 PREPARATION FOR SHIPMENT....21
15 DOCUMENTATION....22
16 CERTIFICATION....23
17 VALVES SUPPLIED TO EUROPEAN SITES....23
18 WITNESSING BY THE PRINCIPAL....23
ANNEX A REQUIREMENTS FOR NON-DESTRUCTIVE EXAMINATION....23
ANNEX B SUPPLEMENTARY TEST REQUIREMENTS....23
ANNEX D PURCHASING GUIDELINES....24
ANNEX F RECOMMENDED PRACTICE FOR QUALIFICATION OF HEAT-TREATING EQUIPMENT....25

PART IV REFERENCES....28

Documents
Document Sharing Hub

Full document details: SHELL 31.36.00.30 2012

PART I INTRODUCTION

1.1 SCOPE

This DEP specifies requirements and gives recommendations for the design, manufacturing, testing and documentation of ball, check, gate and plug valves for application in pipeline systems meeting the requirements of ISO 13623 for the petroleum and natural gas industries.

Valves for pressure ratings exceeding PN420 (Class 2500) are not covered by this DEP.

This DEP is based on ISO 14313, Second Edition, December 2007 (including Technical Corrigendum 1 of January 2009). Part III of this DEP amends, supplements and deletes various clauses of ISO 14313. In this DEP, ISO 14313:2007 (including Corrigenda) and API Spec 6D:2008 (including Errata) provide the same technical result for a particular provision. Clauses in ISO 14313, which are not mentioned in this DEP remain valid as written.

This is a revision of the DEP of the same number dated October 2001; see (1.5) regarding the changes.

1.2 DISTRIBUTION, INTENDED USE AND REGULATORY CONSIDERATIONS

Unless otherwise authorised by Shell GSI, the distribution of this DEP is confined to Shell companies and, where necessary, to Contractors and Manufacturers/Suppliers nominated by them. Any authorised access to DEPs does not for that reason constitute an authorization to any documents, data or information to which the DEPs may refer.

This DEP is intended for use in facilities related to oil and gas production, gas handling, oil refining, chemical processing, gasification, distribution and supply/marketing. This DEP may also be applied in other similar facilities.

When DEPs are applied, a Management of Change (MOC) process shall 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 could be more stringent than in this DEP, the Contractor shall determine by careful scrutiny which of the requirements are the more stringent and which combination of requirements will be acceptable with regards to the safety, environmental, economic and legal aspects. In all cases the Contractor shall inform the Principal of any deviation from the requirements of this DEP 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, the objective being to obtain agreement to follow this DEP as closely as possible.

1.3 DEFINITIONS

1.3.1 General 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 it. 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 capitalised term **SHALL [PS]** indicates a process safety requirement.

The word **should** indicates a recommendation.

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1.3.2 Specific definitions

Term	Definition
manufacturer	This term means Manufacturer/Supplier when used in Part III of this document.
by agreement	This phrase means agreed between manufacturer and purchaser
Drive Train	All parts of a valve drive between the operator and the obturator, including the obturator but excluding the operator.
Obturator	Part of a valve, such as a ball, clapper, disc, gate or plug that is positioned in the flow stream to permit or prevent flow.
Pressure-Containing Parts	Parts, whose failure to function as intended results in a release of contained fluid into the environment.
Process-Wetted Parts	Parts exposed directly to the pipeline fluid.
Uni-Directional Valve	Valve designed for blocking the flow in one direction only.

1.3.3 Abbreviations

Term	Definition
MESC	Material and Equipment Standards and Code
MSS	Manufacturers Standardization Society
SAE	Society of Automotive Engineers

1.4 CROSS-REFERENCES

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

1.5 SUMMARY OF MAIN CHANGES

This DEP is a revision of the DEP of the same number dated October 2001. This DEP, now based on ISO 14313:2007 – which has been back-adopted as API Spec 6D:2008, has been a total rewrite and it is therefore impractical to summarise the changes here.

1.6 COMMENTS ON THIS DEP

Comments on this DEP may be sent to the Administrator at standards@shell.com, using the DEP Feedback Form. The DEP Feedback Form can be found on the main page of "DEPs on the Web", available through the Global Technical Standards web portal http://sww.shell.com/standards and on the main page of the DEPs DVD-ROM.

1.7 DUAL UNITS

This DEP contains both the International System (SI) units, as well as the corresponding US Customary (USC) units, which are given following the SI units in brackets. When agreed by the Principal, the indicated USC values/units may be used.

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PART II GENERAL

Part III of this DEP is written as amendments and supplements to ISO 14313, Second Edition, December 2007 (including Technical Corrigendum 1 of January 2009). Wherever reference is made to ISO 14313, it shall be understood to mean ISO 14313, Second Edition, December 2007 (including Technical Corrigendum 1 of January 2009) as amended/supplemented by this DEP.

For ease of reference, the clause numbering of ISO 14313 has been used throughout Part III of this DEP.

Clauses in ISO 14313, which are not mentioned in this DEP, shall remain valid as written.

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PART III AMENDMENTS/SUPPLEMENTS TO ISO 14313

6 VALVE TYPES AND CONFIGURATIONS

6.1.1 Gate valves

Add:

All designs shall be engineered to eliminate the possibility of the segments jamming and preventing operation of the valve.

Uni-directional valves, shall be clearly marked as per Clause 13.

All designs shall eliminate potential galling of all sliding components. The purchase order shall specify the design required.

6.1.2 Lubricated and non-lubricated plug valves

Add:

Unless otherwise specified all lubricated taper plug valves shall be of the inverted plug "Pressure Balanced Design" in which the line pressure is used to keep the plug in a "balanced" condition. Lubricated plug valves shall have a bottom entry design.

Sealing for lubricated taper plug valves shall be accomplished using a lapped tapered metal plug fitted to a lapped tapered metal body. The valve shall be a metal-to-metal seated design.

Lubricated plug valves shall be furnished with an internal lubricating system that is capable of delivering lubricant to the body/plug contact surfaces in the seating and seal areas. Grooves shall be provided in the body/plug surfaces. The grooves shall be arranged so that lubricant under pressure will be transmitted to all parts of the system when the valve is fully open or closed, thereby sealing the ports and facilitating operation.

Lubricated plug valves shall be furnished with hydrocarbon-resistant lubricating sealant containing a non-hygroscopic fumed silica viscosity improver that has both proper plasticity for tight sealing and lubricity for ease of operation over the entire design temperature range of the valve.

The plug of lubricated valves and shall be furnished with anti friction treatment, either polytetrafluoroethylene (PTFE) or molybdenum disulfide.

For lubricated plug valves the stem and plug shall not be one integral piece.

6.1.3 Ball valves

Add:

The obturator shall be a one-piece casting or a forging and shall be trunnion mounted. The ball port shall be cylindrical.

To avoid flow erosion to seal surfaces, ball valves shall not be used for flow control nor be left in a part open position. All operation is from full open to full close and vice versa and, wherever this is performed in a flow stream, it will be performed as quickly as practical.

Soft seated valves are preferable for offshore (topside) applications and for clean dry gas export service where there is no pigging requirement.

6.1.4 Check valves

Add:

The clapper of swing check valves should preferably be hung from the bonnet.

Unless ring joint faces are specified, gasket surfaces for retainerless dual plate check valves:

- shall not be interrupted in excess of the allowances established for “Permissible Imperfections in Flange Facing Finish” as specified in ASME B16.5, or ASME B16.47 as applicable. The restrictions to the interruptions shall consider the

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potential eccentricity of gaskets after installation, resulting from the difference between bolt hole and bolt diameter as specified in the drilling template tables in ASME B16.5 and ASME B16.47 as applicable;

- may be interrupted by bolts to a maximum extent of 20 % of the sealing area;
- shall be suitable for spiral wound gaskets for sizes ≤ DN 600 (≤ NPS 24);
- shall be suitable for covered serrated metal (Camprofile) gaskets for sizes > DN 600 (> NPS 24) as specified in MESC SPE 85/100.

When retainerless dual plate check valves are assembled and compressed by the mating flange, the seat retainer face shall not protrude beyond the body face.

6.2.2 Reduced – opening valves

Delete the following sentence:

- valves above DN 600 (NPS 24): by agreement.

And replace with:

- valves above DN 600 (NPS 24): three sizes below nominal size of valve with bore according to Table 1.

Add:

The minimum and maximum internal bore dimensions shall be stated in the quotation.

7 DESIGN

7.1 DESIGN STANDARDS AND CALCULATIONS

Add:

The design SHALL [PS] be based on the most unfavourable pressure/temperature rating of the appropriate class.

The body to bonnet bolt sizing shall be in accordance with ASME VIII or ASME B16.34.

For bonnet/cover attachment by bolting, the mating flange between the body and bonnet/cover shall be of a suitable shape to provide adequate strength.

Bonnet/cover flange bolting shall be of the stud or stud bolt type. Not less than four bolts shall be used in any flange and no bolting shall be less than 10 mm (3/8 in) in diameter.

The manufacturer shall inform the Principal of any limitations.

7.2 PRESSURE AND TEMPERATURE RATING

Add:

The valve body shall have sufficient rigidity to withstand a compressive axial thrust exerted by the connected piping, equal to the design pressure multiplied by the area of the maximum valve bore, without permanent distortion of the body or affecting the free movement and sealing of the obturator and the seats.

The pressure/temperature rating of the valve shall be in accordance with the appropriate class for the body material in ASME B16.5 or ASME B16.34 for temperatures up to 150°C (302°F). At higher temperatures the manufacturer SHALL specify the rating for valves containing polymeric seat or sealing materials.

The valve shall withstand vacuum drying at pressures of 500 Pa (0.07 psi).

The manufacturer shall specify the pressure/temperature ratings for valves with limited construction details or material considerations with restricted seating.

For non-metallic materials other than graphite, the rated pressure at the upper and lower design temperatures shall be specified on the general arrangement drawing.

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