

DEP SPECIFICATION

PIPELINE TRANSPORTATION SYSTEMS - PIPELINE VALVES (AMENDMENTS/SUPPLEMENTS TO API SPEC 6D)

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DESIGN AND ENGINEERING PRACTICE

DEM1



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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 ASME Class 2500 (PN420) are not covered by this DEP.

This DEP is based on API Specification 6D, Twenty-Fourth Edition, August 2014 (including Errata). Part III of this DEP amends supplements and deletes various clauses of API SPEC 6D. Part III follows the clause numbering of API SPEC 6D for easy reference.

All clauses of API SPEC 6D not modified by this DEP remain valid as written.

This DEP contains mandatory requirements to mitigate process safety risks in accordance with Design Engineering Manual (DEM) 1 – Application of Technical Standards.

This is a revision of the DEP of the same number dated February 2012; 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 authorisation 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.

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
ESD	Emergency Shut Down
MESC	Material and Equipment Standards and Code
MSS	Manufacturers Standardization Society
SAE Spec	Society of Automotive Engineers Specification

1.4 CROSS-REFERENCES

Where cross-references to other parts of this DEP are made, the referenced section or clause 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 February 2012 based on ISO 14313 second edition, December 2007(including Errata). The current DEP revision is now based on API Spec 6D: 2014, twenty-fourth edition (including Errata). The following are the main non-editorial changes:

Section/Clause		Change
Old	New	
-	3.1.31	Revised definition for pressure containing parts added
6	4	Valve type and configuration (Change in section no in line with API SPEC 6D)
6.1.3	4.1.3	Use of metal seated valves for valves opening against differential pressure capable of creating sonic flow conditions in the initial opening stages.
7	5	Design (Change in section no in line with API SPEC 6D)
7.7.2	5.7.2	Additional requirements for pup pieces added

Section/Clause		Change
Old	New	
7.8	5.8	For double seated valves where liquids can be trapped in the body cavity while subject to temperature changes and consequent expansion of the liquid, the principal specifies in the purchase order the provision of cavity relief functionality.
7.9	5.9	Drain connections on a CRA clad valve
7.13	5.16	Additional requirements on position indicators
7.18.1	5.18.1	Additional requirements of quarter turn on/off actuators conforming to DEP 32.36.01.18-Gen.
7.20.1	5.20.1	Valves in special protective functions to have design thrust or torque of 2.5 times the breakaway thrust or torque. The gear box output torque rating to be at least 1.5 times the maximum operating torque of the valve.
7.22	5.22	Fire type-testing according to various global standards covered.
7.22	5.22.4	Fire tested valves equipped with passive fire protection certified for a minimum of 30 minutes protection time against a hydrocarbon jet fire of 450 kW/m ² (140,000 Btu/h).
N/A	5.28	Elastomeric seals comply with MESC SPE 85/301.
8	6	Materials (Change in section no in line with API SPEC 6D)
8.7	6.8	Removal of statement "Valves in sour service meet the requirement of ISO 15156:2009 (all parts including technical circulars up to 2014) or NACE MR0103:2012 as specified by the Principal."
9.2	7.3	The impact test requirement in accordance with MESC SPE 77/302
9.5	7.7.3	Butt welded end valves with or without pipe pups shall have their internals protected from welding / grinding / cutting debris during field installation.
10.3.1	8.3.4	Qualification for welding inspectors added.
11.1	9.1	Where regulatory requirements exceed the test requirements in this document, the purchaser specifies the applicable test requirement.
13	11	Each flange shall be provided with a 'SPE' mark on the side that contains a single piston effect seat and with a 'DPE' mark on the side that contains a double piston effect seat.
-	Annex-A	No supplementary requirements added
-	Annex-B	No supplementary requirements added
-	Annex-D	No supplementary requirements added
-	Annex-H	Supplementary requirements added
-	Annex-O	Supplementary requirements added

1.6 COMMENTS ON THIS DEP

Comments on this DEP may be submitted to the Administrator using one of the following options:

Shell DEPs Online (Users with access to Shell DEPs Online)	Enter the Shell DEPs Online system at https://www.shelldeps.com Select a DEP and then go to the details screen for that DEP. Click on the "Give feedback" link, fill in the online form and submit.
DEP Feedback System (Users with access to Shell Wide Web)	Enter comments directly in the DEP Feedback System which is accessible from the Technical Standards Portal http://swwww.shell.com/standards . Select "Submit DEP Feedback", fill in the online form and submit.
DEP Standard Form (Other users)	Use DEP Standard Form 00.00.05.80-Gen. to record feedback and email the form to the Administrator at standards@shell.com .

Feedback that has been registered in the DEP Feedback System by using one of the above options will be reviewed by the DEP Custodian for potential improvements to the DEP.

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.

1.8 NON NORMATIVE TEXT (COMMENTARY)

Text shown in italic style in this DEP indicates text that is non-normative and is provided as explanation or background information only.

Non-normative text is normally indented slightly to the right of the relevant DEP clause.

PART II GENERAL

Part III of this DEP is written as amendments and supplements to API Specification 6D Twenty Fourth Edition, August 2014 (including Errata). Wherever reference is made to API SPEC 6D it shall be understood to mean API Specification 6D Twenty-Fourth Edition, August 2014 (including Errata) as amended/supplemented by this DEP.

For ease of reference the clause numbering of API SPEC 6D has been used throughout Part III of this DEP.

Clauses in API SPEC 6D, which are not mentioned in this DEP, shall remain valid as written.

PART III AMENDMENTS/SUPPLEMENTS TO API SPEC 6D

3. Terms, Definitions, Acronyms, Abbreviations, Symbols, and Units

3.1 Terms and Definitions

3.1.31 pressure-containing parts

Replace with the following:

1. A part whose failure to function as intended results in a release of contained fluid into the environment and as a minimum includes bodies, end connections, bonnets/covers, stems and shafts that pass through the pressure boundary.

4. Valve Types and Configurations

4.1 Valve Types

4.1.1 Gate Valves

Add the following to this clause:

1. All designs shall be engineered to eliminate the possibility of the gate segments jamming and preventing operation of the valve.
2. Uni-directional valves shall be clearly marked as per Clause 11.
3. All designs shall eliminate potential galling of all sliding components.
4. The purchase order shall specify the API SPEC 6D design types required.

4.1.2 Lubricated and Nonlubricated Plug Valves

Add the following to this clause:

1. Unless otherwise specified, all lubricated taper plug valves shall be of the pressure-balanced inverted plug design in which the line pressure is used to keep the plug in a balanced condition.
2. Lubricated plug valves shall have a bottom entry design.
3. Sealing for lubricated taper plug valves shall be accomplished using a lapped tapered metal plug fitted to a lapped tapered metal body.
 - a. The valve shall be a metal-to-metal seated design.
4. 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.
5. Grooves shall be provided in the body/plug surfaces and 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.
6. 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.
7. The plug of lubricated valves shall be furnished with anti-friction treatment, either one of the following:
 - a. polytetrafluoroethylene (PTFE);
 - b. molybdenum disulfide.
8. For lubricated plug valves the stem and plug shall not be one integral piece.