DEP SPECIFICATION

WELDING ON PRESSURIZED PIPES (AMENDMENTS/SUPPLEMENTS TO API STANDARD 1104)

DEP 30.10.60.30-Gen.

February 2011
(DEP Circular 60/11 has been incorporated)

ECCN EAR99

DESIGN AND ENGINEERING PRACTICE

DEM1

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PART I INTRODUCTION AND GENERAL REQUIREMENTS

1. INTRODUCTION

1.1 SCOPE

This DEP specifies requirements and gives recommendations for the welding of fittings, sleeves, branches or attachments onto pressurised carbon steel pipelines (X70 or lower strength) and on-plot piping using SMAW welding only.

This DEP is not applicable to tanks or vessels, or to pipelines and piping transporting category A fluids operating below 10 bar (ga) (150 psig).

Part II of this DEP provides amendments and supplements to clauses of API Standard 1104.

For definition of fluid categories reference is made to DEP 31.40.00.10-Gen.

Design verification and safety aspects of welding on pressurised pipes are addressed in DEP 31.38.60.10-Gen, including pipeline and piping operating limits.

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 January 2010; see (1.6) 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 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 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 which carries out all or part of the design, engineering, procurement, construction, commissioning or management of a project, or operation or maintenance of a facility. The Principal may undertake all or part of the duties of 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 lower-case word **shall** indicates a requirement.

The capitalised term **SHALL [PS]** indicates a process safety requirement.

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The word **should** indicates a recommendation.

1.3.2 Specific definitions

Batch	Equivalent term for lot of electrodes (used by AWS)
Buttering	Weld metal deposited on the surface(s) of the parent material(s) to give build-up
Company	Term used in API Standard 1104 which shall be taken to mean the Principal
Run pipe	The pressurised pipe to which a fitting, sleeve, branch, or attachment will be welded.

1.4 ABBREVIATIONS

BGAS	British Gas Approval Scheme
CSWIP	Certification Scheme of Welding Inspection Personnel
HAZ	Heat Affected Zone
NDT	Non-Destructive Testing
OD	Outside Diameter
pWPS	Preliminary Welding Procedure Specification(s)
SMAW	Shielded Metal Arc Welding
SMYS	Specified Minimum Yield Strength
WPQR	Welding Procedure Qualification Record(s)
WPS	Welding Procedure Specification(s)

1.5 CROSS-REFERENCES

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

1.6 SUMMARY OF CHANGES SINCE PREVIOUS EDITION

The previous edition of this DEP was dated January 2010. The previous edition was based on API 1107 that has been withdrawn and is replaced by Appendix B of API 1104.

1.7 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.

1.8 DUAL UNITS

Amended per
Circular 60/11
Dual units have been incorporated throughout this DEP.

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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2. GENERAL REQUIREMENTS

2.1 GENERAL

Part II of this DEP amends and supplements API Standard 1104, 20th edition, October 2005, including:

a) Errata/Addendum, July 2007,

b) Errata 2, December 2008,

c) Reaffirmed, April 2010.

The requirements herein are supplementary to those in Appendix B and therefore sections of this DEP will reference the body of API Standard 1104 as well as Appendix B.

For ease of reference, the clause numbering in of API Standard 1104 has been used throughout Part II of this DEP. Clauses of API Standard 1104 that are not mentioned in this DEP shall remain applicable as written.

2.2 INFORMATION TO BE SUPPLIED BY THE PRINCIPAL

The following information shall be supplied by the Principal to the Contractor at the enquiry stage of the order:

a) Location of the welding operation.

b) Fluid and process conditions in the pipeline or piping.

c) Specification of pipe, fittings, and repair materials.

d) Applicable safety regulations.

e) Which of the Contractor's quality system procedures and records will be subject to agreement (Part II - 8.2.1 of this DEP).

f) Whether the Contractor's selected welding electrodes are to be agreed.

g) Whether contract-specific qualification of welding procedures and welders is required or whether pre-qualified procedures and welders may be used (Part II, 2.1 of this DEP).

h) Whether qualification welding and/or production welding will be witnessed by the Principal.

i) Whether thermocouple locations for qualification welding are to be agreed (Part II, 2.5 of this DEP).

j) Whether the Contractor's welding inspection personnel may be certificated by specific alternative agencies (Part II, 5.6 of this DEP).

k) The specific documentation to be submitted upon completion of the work (Part II, 8.3 of this DEP).

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PART II AMENDMENTS/SUPPLEMENTS TO API Standard 1104

1 GENERAL

1.1 SCOPE

Add the following:

Only the SMAW welding process shall be used for welding governed by this DEP.

2 REFERENCED PUBLICATIONS

Add the following:

See also Part III of this DEP.

Add the following new section:

2.1 QUALITY ASSURANCE SYSTEM

The Contractor's contract-specific quality plan shall be submitted for agreement prior to the commencement of welding.

NOTE: Review by the Principal of a preliminary quality plan at the enquiry stage may assist the process.

The Contractor should maintain and operate a quality assurance system in accordance with ISO 9001 or ISO 9002. The Contractor may maintain and operate a quality assurance system based on an alternative standard which may be considered by the Principal for agreement.

NOTE: Attention is drawn to the possible use of the complementary requirements of ISO 3834-2.

3 DEFINITION OF TERMS

3.2 DEFINITIONS

3.2.3 Company

Delete this subsection and replace with the following:

This term shall be understood to mean the Principal as defined in (1.3.1).

3.2.21 WPQR

WPQR is used to describe both the record of a qualification or the qualification welds and any acts associated with making the qualification welds.

3.2.22 Sour Service

As defined in DEP 30.02.10.15-Gen.

4 SPECIFICATIONS

4.1 EQUIPMENT

Delete from first sentence “both gas and arc”.

Delete third sentence.

Add the following:

All work and equipment shall comply with the Principal’s safety regulations.

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4.2 MATERIALS

4.2.2 Filler metal

4.2.2.1 Type and size

Delete this section and replace with the following:

Electrodes shall be of the basic coated low-hydrogen type: class EXX16 or EXX18 of AWS A5.5, or an equivalent alternative class and specification. For sour service, the electrodes shall not deposit weld metal containing more than 1.0 wt % nickel (Ni).

The level of testing for all electrodes shall be Schedule K of AWS A5.01 which shall be taken as Schedule J plus chemical analysis for the particular electrode sizes which are not required to be chemically analyzed by AWS A5.5. For alternative electrodes, the level of testing shall be at least the same.

The batch classification shall be C3 of AWS A5.01.

Electrode inspection certificates for each batch shall be in accordance with ISO 10474 3.1.B. (AWS classification in US)

For welds that contact the run pipe, the electrodes shall be suitable for downhill welding and this shall be clearly stated in the Manufacturer/Supplier's datasheets. For other welds, electrodes may be of the type normally used for uphill welding. The electrodes shall have type approval by a certifying authority such as DnV or Lloyd's.

Each electrode shall have the AWS or other appropriate classification marked on the flux near the grip end. Electrodes which do not have this marking shall be removed from the job site to the satisfaction of the Principal.

Buttering runs shall be deposited with small diameter electrodes.

4.2.2.2 Storage and handling of filler metal

Add the following:

Electrodes shall be stored in accordance with the Manufacturer's instructions in their original containers which shall be marked with the Manufacturer's name, the consumable trade name, and the batch number. Electrodes in containers which are not identifiable and traceable shall be removed from the job site to the satisfaction of the Principal. To limit electrode handling and the concerns over hydrogen control of these critical welds, vacuum packaged electrodes are recommended.

Electrodes shall be treated and handled in accordance with the Manufacturer's instructions to achieve the lowest practicable diffusible hydrogen content in the deposited weld metal.

Electrodes that can be bake out shall not be baked more than twice.

4.2.3 Shielding gases

Delete this section in its entirety.

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