

**DEP SPECIFICATION**

**PIPING CLASSES - REFINING AND CHEMICALS**

DEP 31.38.01.12-Gen.

February 2014

**DESIGN AND ENGINEERING PRACTICE**

**DEM1**



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## 1. INTRODUCTION

### 1.1 SCOPE

This DEP specifies requirements and gives recommendations for piping classes which have been developed for use in refineries and chemical plants.

The basis of design of the piping classes is given in DEP 31.38.01.10-Gen.

The general requirements for piping systems are specified in DEP 31.38.01.11-Gen.

Piping classes developed primarily for exploration and production facilities are contained in DEP 31.38.01.15-Gen. Piping classes that are applicable to Canadian standard CSA Z662 are contained in DEP 31.38.01.23-Gen.

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 September 2013. For an overview of the changes to the piping Code and the individual piping classes since the previous edition, see (1.5).

### 1.2 DISTRIBUTION, INTENDED USE AND REGULATORY CONSIDERATIONS

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This DEP is intended for use in facilities related to oil refineries, chemical plants, gas plants and supply/distribution installations, and, where applicable, onshore exploration and production facilities (all within the property limits as defined in ASME B31.3:2012, Section 300.1). 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                                                                                                                                                                                             |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Hydrogen Service</b>         | Service in which the process stream contains hydrogen at a partial pressure of 7 bar (abs) and higher.                                                                                                 |
| <b>Low Temperature</b>          | Metal temperature of 0 °C (32 °F) and lower.                                                                                                                                                           |
| <b>MESC</b>                     | Materials and Equipment Standards and Codes                                                                                                                                                            |
| <b>Piping class</b>             | Assembly of piping components in a piping system, suitable for a defined service within design limits.                                                                                                 |
| <b>Post Weld Heat Treatment</b> | Heat treatment carried out after welding to reduce residual stresses and to temper hardened microstructures created by welding.                                                                        |
| <b>Very toxic (substances)</b>  | Substances that are very hazardous for the environment or human health, as specified in DEP 01.00.01.30-Gen. (which also identifies "toxic" substances by reference to chemical substances databases). |

### 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 (7).

### 1.5 SUMMARY OF MAIN CHANGES

#### 1.5.1 General

This DEP is a minor revision of the DEP of the same number dated September 2013.

Shell global standards have been aligned with practices applied in Shell in the Americas. After the introduction of socket welded piping components and valves in a wide range of carbon steel (sour), alloy steel and super duplex stainless steel piping classes, in version 37 of the DEPs, in this edition of the DEP, mainly gaps have been closed to address different material selection philosophies applied in the Americas.

Piping classes have been developed for application in the development of Floating facilities for the liquefaction of natural gas at sea, in line with practices defined in Lloyds rules for Floating Offshore Installations at a fixed location (FOIFL).

Some piping classes have been updated to align with the development of their relevant DEP basis of design, such as those for gaseous oxygen and caustic soda.

The definition in MESC of branch nipples plain as well as flanged and their selection in piping classes has been enhanced. The definition of carbon and low temperature carbon steel pipes DN300 (NPS12) SCH20 (6.35 mm/ 0.25 in) has been aligned with the market.

In addition to the above, changes in the presentation have been made to the content of the piping classes. The printed format of reducing component tables has been simplified.

The most substantial changes are explained in the following paragraphs.

For a detailed overview of the changes in each piping class, reference is made to (Appendix A). The piping class revision history is indicated in (Appendix B). For both documents reference is made to separate Excel files.

This DEP has reference to MESC 13<sup>C</sup> onwards. MESC numbers referred to in the piping classes contained in this DEP shall be extracted from MESC version 13<sup>C</sup> and above.

#### 1.5.2 Branch nipples

The definition in MESC of branch nipples plain as well as flanged and their selection in piping classes has been enhanced, through reference to an extended set of parameters.