

GENERAL SPECIFICATION

Drilling & Wells

GS EP FP 410

Subsea Wellhead and Guidance Systems

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1. Scope

This document covers the minimum requirements, which shall apply for the design of the Subsea Wellhead System.

The presented technical requirements shall be applicable to subsea wellhead systems to be used for subsea production and / or injection wells.

2. Reference documents

The reference documents listed below form an integral part of this General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the effective date of the CONTRACT for the procurement of Wellhead System.

This General Specification and all other equipment specifications referenced herein are based on a set of Industry Standards and Company internal rules identified below.

This General Specification is supplementary to document **GS EP SPS 001** and shall therefore be used in conjunction with said document and other Company specifications and standards identified therein. The relationship between the main Company documents defining the requirements to the Subsea Stations is illustrated in **GS EP SPS 001**.

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External Documents

Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the effective date of this document.

Reference	Title
API RP 5C6	Pipe with Welded Connectors
API SPEC 6A / ISO 10423	Specification for Wellhead and Christmas Tree Equipment
API SPEC 17D / ISO 13628-4	Design and Operation of Subsea Production Systems – Subsea Wellhead and Tree Equipment
ASME-BPVC-2019 Section VIII, Division 1	ASME Boiler and Pressure Vessel Code (BPVC), Section VIII- Rules for Construction of Pressure Vessels - Division 1
DNV-2011-0063	Wellhead Fatigue Analysis Method
DNVGL-RP-0034	Steel Forgings for Subsea Applications
DNVGL-RP-B202	Steel Forgings for Subsea Applications – Quality Management Requirements
ISO 10005	Quality management - Guidelines for quality plans.
ISO 14001	Environmental Management Systems - Requirements with Guidance for use.
ISO/TS 29001	Petroleum, Petrochemical and Natural Gas Industries - Sector-Specific Quality Management Systems - Requirements for product and service supply organizations.

Total General Specifications

Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published in the applicable yearly collection.

Reference	Title
GS EP SPS 001	Subsea Production Systems General Design Requirements
GS EP FP 332	Specification for Wellhead & X-mas Tree Manufacturing

3. Introduction

3.1 Abbreviations

API	American Petroleum Institute
BOP	Blow out preventer
DTHT	Drill Through Horizontal Trees
FAT	Factory Acceptance Test
HQ	Headquarters
HP	High Pressure (housing)
HXT	Horizontal Xmas Tree
ID	Internal Diameter
QCP	Quality Control Plan
LP	Low Pressure (housing)
LRP/EDP	Lower Riser Package / Emergency Disconnect Package. A downhole package used for running VXTs, and allowing trough tubing interventions on VXTs and HXTs
MPI	Magnetic Particle Inspection
NDT	Non-Destructive Testing
OD	Outside Diameter
PAUT	Phased Arrays Ultra sonic
PGB	Permanent Guide Base
PO	Purchase Order
ROV	Remotely Operated Vehicle
SCF	Stress Concentration Factor
TGB	Temporary Guide base
THS	Tubing Head Spool
TH	Tubing Hanger
VXT	Vertical Xmas Tree
WH	Wellhead
XMT	Xmas Tree

3.2 Responsibility

It is the responsibility of the Contractor who supplies equipment under this Specification to ensure and document compliance with the requirements defined herein, and in other referenced industry standards, Project Particular Specification and statutory requirements. Any deviation from any of

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the requirements defined herein shall be clearly documented and submitted to Company for approval.

The Project Particular Specification shall cover, for example, wellhead size (18-3/4" standard, Large Bore or 13-5/8" Slim Bore), Christmas Tree type (vertical, horizontal, mono-bore), satellite or template wellhead, pressure rating or some particular requirements (for example cutting re-injection or heavy casing programs).

In the event of a discrepancy between standards and / or specifications, the more stringent applies unless otherwise specified by Company.

This technical Specification is supplementary to document **GS EP SPS 001**, and therefore has to be read in conjunction with said document and with other Company Specifications and Standards identified therein. The relationship between the main Company documents defining the requirements applicable to the Subsea Stations is illustrated in **GS EP SPS 001**.

4. System description

The Specification is applicable to any type of exploration and development scenario, as clearly stated within **GS EP SPS 001**.

4.1 Base Design

This specification describes the functional and technical requirements for a conventional well architecture with two casing hangers suspended in the high pressure housing. Additional requirements such as shallow liners, a third casing hanger, or any other item are wells specific and will be described in the Tender documents whenever required.

The forgings used in the manufacture of the wellhead system shall meet the minimum requirements presented in **DNVGL-RP-0034** and **DNVGL-RP-B202**.

The wellhead system shall be identical for all subsea stations of a given project except when Cutting Re-Injection (CRI) is contemplated.

The subsea wellhead system shall incorporate the following subcomponents:

- A Guide Base which will be specific to each type of well: a Permanent Guide Base for development wells, a Temporary Guide Base for exploration wells. Note that for the particular case of a multi-well structure, there will be no requirement for a Permanent Guide Base.
- A LP Conductor Housing with a project specific extension (OD, Length, Wall Thickness, Grade, Connector type).
- A HP Wellhead Housing, which shall allow accommodate 2 casing hangers with pack-off seal assemblies. Specifics of the extension (OD, Length, Wall Thickness, Grade, Connector type) will be prescribed for every project.
- A 13-3/8" or 14" casing hanger and a 10-3/4" or 9-5/8" casing hanger complete with pack-off seal assemblies.
- The tooling required for the installation of all equipment: PGB or TGB together with LP housing, HP housing, casing hangers, seal assemblies, wear bushings, test tools.
- The tooling required for the testing of seal assemblies and BOPs.