



Exploration & Production

GENERAL SPECIFICATION

SURVEYS

GS EP GEO 703

**Requirements for design and installation of
drag anchors and anchor piles for
offshore floating structures**

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1. Scope and purpose

1.1 Objective

This document gives the minimum requirements applicable for the design and installation of conventional drag anchors and anchor piles for mooring offshore floating structures. The objective is to obtain satisfactory and consistent quality in the studies and works to be provided by the CONTRACTOR in charge of design and/or installation of such anchors.

For temporary moorings for exploration drilling rigs (MODUs), or for permanent moorings for production structures (e.g. FPSO/FSO, semi-submersible FPU, or other DDCUs such as the SPAR), it covers the following types of anchors:

- Conventional drag anchors in catenary mooring systems
- Drag-in plate anchors in taut-leg moorings
- Anchor piles for permanent moorings for production structures.

This General Specification applies to:

- Acquisition and interpretation of specific site and soil data
- Geotechnical and structural design considerations
- Minimum requirements for monitoring of the installation behaviour.

Deviations from any of the requirements defined herein shall be treated as non-conformances in accordance with COMPANY procedures.

1.2 Abbreviations

The following abbreviations are used:

- **API** American Petroleum Institute
- **CALM** Catenary Anchor Leg Mooring
- **CPTU** Cone Penetration Test with pore pressure measurement
- **DDCU** Deep Draught Caisson Unit
- **FPSO/FSO** Floating Production Storage and Off-loading vessel
- **FPU** Floating Production Unit
- **ISO** International Standard Organisation
- **MODU** Mobile Drilling Unit
- **ROV** Remotely Operated Vehicle
- **TLM** Taut Leg Mooring
- **TLP** Tension Leg Platform
- **VLA** Vertically Loaded Anchor

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.

This specification is complementary to the following documents:

- **GS EP STR 402** and **GS EP STR 661** for design and installation of mooring systems
- **GS EP STR 431** for installation of driven piles
- **GS EP GEO 101** and **GS EP GEO 201** for site investigation equipment and procedures.

Therefore, this specification shall be read in conjunction with above documents and the other COMPANY specifications and standards identified herein.

Standards

Reference	Title
ISO 19900	Petroleum and Natural Gas Industries - Offshore Structures - Part 1: General Requirements
ISO 19901-4	Petroleum and natural gas industries - Specific requirements for offshore structures - Part 4: Geotechnical and foundation design considerations
ISO 19901-7	Petroleum and natural gas industries - Specific requirements for offshore structures - Part 7: Stationkeeping systems for floating offshore structures and mobile offshore units
ISO 19902	Petroleum and Natural Gas Industries - Fixed Steel Offshore Structures
ISO 19904	Petroleum and Natural Gas Industries - Floating Offshore Structures - Part 1: Monohulls, Semi-submersibles and Spars. Part 2: Tension Leg Platforms

Professional Documents

Reference	Title
AISC ASD	Manual of Steel Construction - Allowable Stress Design
API Bulletin 2U	Bulletin on Stability Design of Cylindrical Shells
API Bulletin 2V	Bulletin on Design of Flat Plate Structures
API RP 2A WSD/LRFD	Recommended Practice for Planning, Designing, and Constructing Fixed Structures - Working Stress Design / Load and Resistance Factor Design
API RP 2SK	Recommended Practice for Design and Analysis of Stationkeeping Systems for Floating Structures
API RP 2T	Recommended Practice for Planning, Designing, and Constructing Tension Leg Platforms

Reference	Title
DNV-RP-E301	Recommended Practice for Design and Installation of Fluke Anchors in Clay
DNV-RP-E302	Recommended Practice for Design and Installation of Drag-In Plate Anchors in Clay

Regulations

Reference	Title
Not applicable	

Codes

Reference	Title
Not applicable	

Other documents

Reference	Title
Not applicable	

Total General Specifications

Reference	Title
GS EP GEO 101	Offshore Geotechnical Soil Survey
GS EP GEO 201	Offshore Geophysical Surveys
GS EP POS 001	Offshore Surface Positioning Works
GS EP POS 002	Subsea Positioning Works
GS EP STR 402	Anchorage for a Support Vessel on an Offshore Site
GS EP STR 431	Installation of Piles for Offshore Steel Structures - Driven Piles
GS EP STR 661	FPSO - Design Requirements for Mooring and Anchoring Systems

3. General requirements for site and soil investigation

The general offshore site and soil investigation equipment and procedures shall be in agreement with the COMPANY Specifications:

1. **GS EP GEO 201** for the performance of geophysical site survey
2. **GS EP GEO 101** for the performance of geotechnical investigation, including soil sampling and laboratory testing, in-situ testing, as well as data interpretation.