

# GENERAL SPECIFICATION

## SURVEYS

### GS EP GEO 101

#### Offshore Geotechnical Survey

|      |         |                                                    |
|------|---------|----------------------------------------------------|
|      |         |                                                    |
| 09   | 05/2015 | Organisation change – January 2015                 |
| 08   | 09/2014 | General update following new ISO standard 19901-8  |
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|------------------------------|-------------------------|----------------------|
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## 1. Scope

The document, giving the minimum requirements applicable to the equipment and procedures for offshore geotechnical surveys, defines standards and references for obtaining satisfactory and consistent quality in offshore soil investigations. It applies to:

- The drilling equipment and procedures
- The equipment and procedures for soil sampling and in-situ testing
- The procedures for laboratory soil testing
- The evaluation and presentation of the geotechnical parameters, as required for the design of the foundations for the intended structure(s), and the reports to be provided by the Contractor
- The safety of offshore survey operations and the Contractor's responsibility.

The present General Specification shall be completed by the Particular Project Specifications given in the Agreement signed between Company and Contractor.

## 2. Reference documents

The reference documents listed below form an integral part of this General Specification.

### 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                                                                                                          |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------|
| <a href="#">API RP 2A-WSD</a>       | Recommended Practice for Planning, Designing and Constructing Fixed Offshore Platforms - Working Stress Design |
| <a href="#">API RP 2GEO</a>         | Geotechnical and Foundation Design Considerations                                                              |
| <a href="#">API RP 2N</a>           | Recommended Practice for Planning, Designing and Constructing Pipelines for Arctic Conditions                  |
| <a href="#">API RP 2SK</a>          | Design and Analysis of Stationkeeping Systems for Floating Structures                                          |
| <a href="#">API RP 2T</a>           | Planning, Designing and Constructing Tension Leg Platforms                                                     |
| <a href="#">ASTM Volume 04.08</a>   | Soil and Rock                                                                                                  |
| <a href="#">BS 1377 (All Parts)</a> | Methods of Tests for Soils for Civil Engineering Purposes - All Parts                                          |
| <a href="#">CEN EN 1997-1</a>       | Eurocode 7 – Geotechnical Design - Part 1: General Rules                                                       |
| <a href="#">CEN EN 1997-2</a>       | Eurocode 7 – Geotechnical Design - Part 2: Ground Investigation and Testing                                    |

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| Reference     | Title                                                                                                                                                                            |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CEN EN 1998-5 | Eurocode 8: Design of Structures for Earthquake Resistance – Part 5: Foundations, Retaining Structures and Geotechnical Aspects                                                  |
| DNV-RP-C207   | Recommended Practice for Statistical Representation of Soil Data                                                                                                                 |
| ISO 19900     | Petroleum and Natural Gas Industries - General Requirements for Offshore Structures                                                                                              |
| ISO 19901-2   | Petroleum and Natural Gas Industries - Specific Requirements for Offshore Structures - Part 2: Seismic Design Procedures and Criteria                                            |
| 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 19901-8   | Petroleum and Natural Gas Industries - Specific Requirements for Offshore Structures - Part 8: Marine Soil Investigations                                                        |
| ISO 19902     | Petroleum and Natural Gas Industries - Fixed Steel Offshore Structures                                                                                                           |
| ISO 19903     | Petroleum and Natural Gas Industries - Fixed Concrete Offshore Structures                                                                                                        |
| ISO 19904-1   | Petroleum and Natural Gas Industries - Floating Offshore Structures - Part 1: Monohulls, Semi-submersibles and Spars                                                             |
| ISO 19905-1   | Petroleum and Natural Gas Industries - Site-Specific Assessment of Mobile Offshore Units - Part 1: Jack-ups                                                                      |
| ISO 19905-2   | Petroleum and Natural Gas Industries - Site-Specific Assessment of Mobile Offshore Units -Part 2: Jack-ups Commentary and Detailed Sample Calculation                            |
| ISO 19906     | Petroleum and Natural Gas Industries – Arctic Offshore Structures                                                                                                                |
| ISO 80000-1   | Quantities and Units – Part 1: General                                                                                                                                           |
| ISRM          | Rock Characterization Testing and Monitoring - ISRM Suggested Methods (1981)                                                                                                     |
| GOST 25100    | Soils. Classification (1995)                                                                                                                                                     |
| SNAME         | Technical and Research Bulletin 5-5 & 5-5A. Recommended Practice for Site Specific Assessment of Mobile Jack-up Units                                                            |

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**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 GEO 110 | Requirements for Offshore Survey Vessels                                                                   |
| GS EP GEO 206 | Seabed Sampling for geochemical, heat flow and biostratigraphic analysis - SGE                             |
| GS EP GEO 401 | GIS requirements for engineering site surveys and studies                                                  |
| GS EP GEO 601 | Seismic Hazard Assessment for Offshore Structures                                                          |
| GS EP GEO 701 | Geotechnical Design Considerations for Soil-Pipeline Interaction                                           |
| GS EP GEO 702 | Requirements for design and installation of skirted foundations and suction anchors                        |
| GS EP GEO 703 | Requirements for design and installation of drag anchors and anchor piles for offshore floating structures |
| GS EP LSO 306 | Selection and Operation of Dynamically Positioned Vessels                                                  |
| GS EP POS 001 | Offshore surface positioning works                                                                         |
| GS EP POS 002 | Subsea positioning works                                                                                   |
| GS EP POS 004 | The use of Differential Global Navigation Satellite System                                                 |
| GS EP SPS 002 | Design of Subsea Stations                                                                                  |
| GS EP STR 431 | Installation of piles for offshore steel structures. Driven piles                                          |
| GS EP STR 432 | Installation of piles for offshore steel structures. Drilled and grouted piles                             |

### 3. Units

Only the ISO international system of units (ISO 80000-1) shall be used. However, the standard diameter and wall thickness of steel tubular pipes can also be expressed in inches (1 inch = 25.4 mm). When this is the case, the symbol used for the inch unit (" or in.) shall be clearly indicated.

### 4. Geotechnical survey vessel

#### 4.1 General requirements

The general requirements for the geotechnical survey vessel shall be in agreement with GS EP GEO 110. Prior to mobilization, the Contractor may need to consent and make available the vessel for the performance of an OVID ('offshore vessels information database') inspection to be conducted.

A survey vessel with dynamic positioning shall be in accordance with GS EP LSO 306. A survey vessel without dynamic positioning shall have at least four mooring points and should be able to

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lay her anchors alone. In the event that assistance from an anchor handling ship is necessary, the characteristics of the required anchor handler shall be mentioned by the Contractor (refer to **GS EP GEO 110**).

If not otherwise mentioned in the Particular Project Specifications, Contractor shall supply the following general documentation about the geotechnical survey vessel:

- Copy of vessel certificates (class, registration, power, insurance, load lines, safety/life saving, management, maintenance and last dry dock certificates), with original documents to be available on the vessel and to be provided at Company's request
- Dimensions and main characteristics, propulsion system and number of thrusters, accommodations, etc.
- Bunker capacity (fuel, potable water, food, consumables, etc.), for allowing to perform the complete geotechnical survey without port call, or 28 days of offshore site work without port call
- Methods of communication (VHF and BLU radio, SATCOM facilities, etc.)
- Helideck dimensions and capacity (if any)
- Equipment and procedures for mooring and/or dynamic positioning
- Specifications of the drilling equipment (derrick, power swivel, seafloor-based frame, system for heave-motion compensation, mud pumps, drill pipes and drill bits)
- Equipment and procedures for measuring the environmental conditions at the survey site, including water depth, surface and sea bottom current, and wind speed
- Equipment and procedures for surveying the sea bottom, in the event that there are subsea wellheads or other obstacles to be identified on the work site
- Onboard test laboratory
- List of previous experiences with the proposed survey vessel.

## 4.2 Positioning

Unless otherwise indicated in the Particular Project Specifications, positioning of the survey vessel at the geotechnical boring locations shall be the responsibility of the Contractor, including supply of the equipment and personnel needed to work 24 hours per day throughout the period of offshore works.

The positioning equipment and procedures shall be in accordance with **GS EP POS 001** for offshore surface positioning, **GS EP POS 002** for subsea positioning, and **GS EP POS 004** for differential global navigation satellite positioning.

A complete description of the positioning system shall be included in the Contractor's technical documentation.