

GENERAL SPECIFICATION

CORROSION

GS EP COR 100

Design of cathodic protection of offshore structures

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1. Scope

This document defines the minimum requirements for the design, calculation methods, selection of equipment and alloy materials, installation and commissioning of external cathodic protection for offshore fixed structures (platforms, wharves, piers, jetties, piles, subsea templates and wells) and floating units (as FPSO, buoys).

Except if formally accepted in a written form by Company, cathodic protection shall be implemented using galvanic (or sacrificial) anodes.

Galvanic and impressed current cathodic protection systems are defined in the present document.

More detailed requirements are specified for subsea equipment in General Specification [GS EP SPS 009](#) and [GS EP SPS 029](#).

More detailed requirements are specified for cathodic protection of floating structures in General Specification [GS EP COR 103](#).

This document also defines the cathodic protection monitoring systems, gives the rules for anode distribution and the requirements to be followed to avoid negative influence induced on metallic structures by high potential alloy anodes (as magnesium alloy) or impressed current anodes.

Where more stringent, the requirements of the present document supersede those of the reference documents. Recommendations from the EN standards related to fixed or floating offshore structures and to harbour installations shall be followed when they are not in conflict with those of the present document. Other recommendations and especially those from [DNV-RP-B401](#) have also to be used in complement when necessary.

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
BS 7361-1	Cathodic protection - Part 1: Code of practice for land and marine applications
DNV-RP-B401	Cathodic Protection Design
EN 12473	General principles of cathodic protection in sea water
ISO 15589-2	Petroleum and natural gas industries - Cathodic protection of pipeline transportation systems – Part 2: Offshore Pipelines

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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 COR 102	Design of cathodic protection of sealine by sacrificial anodes
GS EP COR 103	Design of cathodic protection of offshore floating structures
GS EP COR 201	Supply of sacrificial anodes
GS EP COR 202	Monitoring systems for cathodic protection of offshore structures
GS EP COR 210	Monolithic insulating joints
GS EP COR 222	Fusion Bonded Epoxy (FBE) external coating for pipelines
GS EP COR 230	External laminated glass fibre/resin based coating for risers of sea line
GS EP COR 231	External elastomer based coating for risers of sea line
GS EP COR 350	External protection of offshore and coastal structures and equipment by painting
GS EP COR 351	External protection of structures and equipment by painting. Floating structures
GS EP COR 501	Control of cathodic protection of submerged fixed structures
GS EP ELE 141	Power transformers
GS EP EXP 311	Plant integrity - Minimum inspection requirements
GS EP SPS 009	Corrosion protection of subsea stations
GS EP SPS 029	Metallic Materials for Subsea Production Facilities

3. Qualification and Certification of Cathodic Protection specialists responsible for the design

Design of cathodic protection systems to be installed on offshore structures shall be carried out exclusively by competent and specialized personnel.

The qualification of each of the specialists working for such a design shall be demonstrated to the Owner before commencement of the design.

Therefore the verification of formal Certification of the individuals shall be carried out as follows:

- Conventional design work to be carried out by certified personnel at level 2 for all Certification schemes except for NACE International where it shall be level 3.
- Complex design work or verification to be carried out by certified personnel at level 3 for all Certification schemes except for NACE International where it shall be level 4.

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Accepted Certification schemes are AFAQ AFNOR Compétence (Seawater Application Sector), APCE (Seawater Application Sector), Institute of Corrosion, NACE International. Any other Certification scheme proposed shall be approved by Company.

Any use of non certified personnel for cathodic protection design shall be subject to the approval of Company on a case by case basis (demonstration of competence through detailed curriculum vitae and description of experience).

4. Preliminary assumptions

4.1 Definition of zones

These zones shall be defined as follows:

- Splash zone: as defined in [GS EP COR 350](#)
- Atmospheric zone: area above the splash zone
- Immersed zone: for a platform, area from the splash zone to the stability floor
- Mud line zone: for a platform, area from the bottom of the structure to 2 m above the stability floor
- Buried zones: for a platform, area where piles and conductor pipes are buried.

4.2 Risers - Insulating joints - Appurtenances

Risers of sea lines are normally not electrically insulated from the platform except when either the pipelines or the jackets are cathodically protected by impressed current. In this case, a job specification shall be established specifying the nature of the insulating joint and its location.

Insulating joints shall comply with Company General Specification [GS EP COR 210](#).

If the pipeline is protected by sacrificial anodes, the cathodic protection calculation for the jacket shall include the riser.

Utility risers, J-tubes, sump caissons, etc. shall be included in the cathodic protection design of the jacket.

Except if otherwise stated for specific structural reasons, mud mats are considered useful only for the installation of the jacket and are not supposed to be fully protected for the whole lifetime of the platform. However, they have to be taken into consideration for the design of the CP system over the full design life as they will consume current.

Cathodic protection of SCRs (Steel Catenary Risers) is designed as per the associated pipelines in accordance with [GS EP COR 102](#).

4.3 Painting-Coating

Marine structures shall be coated in the following areas:

- Atmospheric zone
- Splash zone
- Mud line zone.