

## GENERAL SPECIFICATION

### ELECTRICAL

#### GS EP ELE 321

#### Navigational Aids System

|      |         |                                            |
|------|---------|--------------------------------------------|
|      |         |                                            |
| 04   | 10/2012 | Modifications for Helideck requirements    |
| 03   | 10/2007 | Modifications for Helideck requirements    |
| 02   | 10/2005 | Addition of "EP" root to GS identification |
| 01   | 09/2003 | Change of Group name and logo              |
| 00   | 10/2002 | First issue                                |
| Rev. | Date    | Purpose of the revision                    |

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|                              |                         |                      |
|------------------------------|-------------------------|----------------------|
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## 1. Scope

This specification defines the minimum technical requirements for the design, manufacture, operation and testing of Marine Navigational Aids and aviation obstruction lights system for Company installations located either onshore or offshore.

It shall mainly consist of:

- Marine navigation lights
- Fog-horns
- Aviation obstruction lights
- Helideck beacons.

This specification does not deal with the specific requirements for the offshore platform sea transportation.

## 2. Reference documents

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

Design and engineering shall conform as a minimum requirement to the current edition of the following in order of preference:

- Applicable laws, rules and regulations of the country in which the system will be operated
- International rules, codes and regulations
- Company Particular Specifications (if any)
- Company General Specifications
- Applicable CENELEC Standards
- Applicable International Electro-technical Commission (IEC) standards
- Applicable recognised standards and codes (e.g. UTE, BSI, VDE, etc.) where IEC publications have not yet been issued.

### 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                                                                          |
|-------------------------------------------------------|--------------------------------------------------------------------------------|
| Civil Aviation Authority<br>(Safety Regulation Group) | CAP 437: Offshore Helicopter Landing Areas - Guidance on Standards             |
| IALA report                                           | The definition and method of calculation of the nominal range of a fog horn    |
| IALA report                                           | Recommendations for calculation of the effective intensity of a rhythmic light |

| Reference                                                       | Title                                                                                                                                                                  |
|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IEC 60068                                                       | Environmental testing                                                                                                                                                  |
| IEC 60079 (All Parts)                                           | Explosive atmospheres - All Parts                                                                                                                                      |
| IEC 60331-21                                                    | Tests for electric cables under fire conditions. Circuit integrity - Part 21: Procedures and requirements-Cables of rated voltage up to 0.6/1.0 kV                     |
| IEC 60332-3-22                                                  | Tests on electric and optical fibre cables under fire conditions - Part 3-22: Tests for vertical flame spread of vertically-mounted bunched wires or cables-Category A |
| IEC 60529                                                       | Degrees of protection provided by enclosures                                                                                                                           |
| IEC 61000 (All Parts)                                           | Electromagnetic compatibility - All Parts                                                                                                                              |
| IEC 61204                                                       | Low-voltage power supply devices, d.c. output - Performance characteristics                                                                                            |
| International Association of Light house Authorities (I.A.L.A.) | Recommendations on the marking of offshore structures, May 1998                                                                                                        |
| International Civil aviation Organisation (I.C.A.O.)            | Annex 14 Volume II: Heliports                                                                                                                                          |
| UK Department of Transport (D.O.T.)                             | Standard marking schedule for offshore installations<br>Only to be used for North Sea locations or if specified in the Project particular specification                |

### 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 ELE 079 | Electrical apparatus for potentially explosive gas atmospheres |
| GS EP ELE 161 | Electrical cables                                              |
| GS EP ELE 261 | Solar Power System                                             |
| GS EP LSO 115 | Helideck specifications                                        |
| GS EP STR 002 | Crane for fixed offshore installations                         |
| GS EP TEL 410 | Installation rules                                             |

### 3. Specification deviations

The Supplier shall advise the Company of any deviations made in respect of this Specification or the documents referred to herein at the time of tendering. Should this Specification conflict

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with requirements of the listed standards the Supplier shall request clarification from the Company.

## 4. Electrical conditions

Unless otherwise specified in project particular specification, equipment shall be able to operate at rated power with normal supply variations as following:

- Voltage:  $\pm 10\%$
- Frequency:  $\pm 5\%$ .

## 5. EMI/EMC

Equipment that is sensitive to interference shall be designed in such a way that interference caused by EMI shall have no effects on its reliability and pre-defined specifications.

All equipment shall meet the requirements of [IEC 61000](#) (all parts) and CENELEC regarding Electro-Magnetic Compatibility (EMC).

Supplier will indicate in his offer the maximum acceptable THD and voltage dip by the navigational aids system.

## 6. Equipment environmental conditions

### 6.1 Outdoor installed

- Equipment which shall work in case of gas detection must be suitable for zone 1 area classification
- Minimum IP 66 enclosure (as per [IEC 60529](#))
- Equipped with ISO Cable entries
- Cable glands for offshore installations shall be made of marine bronze
- All equipment shall be fully tropicalized according to [IEC 60068\(2-10\)](#): climatic tests
- Enclosure shall be cast iron or cast bronze or fibre glass reinforced resin and resist to marine spray and corrosion. Enclosures of corrosion resistant, copper free aluminium, which have proven to be suitable for the specified environmental conditions, are acceptable
- Electrical terminals shall be insulated clamp type and labelled according to function
- Spare circuit holes, if any shall be plugged with suitably certified plugs
- Bolted earth connections shall be made with corrosion proof materials with spring washers and/or have lock nuts fitted.

### 6.2 Indoor installed

Indoor equipment shall be generally installed inside an air-conditioned technical room, with an average ambient air temperature of 25°C but shall be able to operate on unusual condition such as specified in the Project data sheet.