



Exploration & Production

GENERAL SPECIFICATION

ELECTRICAL

GS ELE 451

**Third party inspection
Independent verification of electrical facilities**

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Contents

1. Scope	3
2. Reference documents.....	3
3. General.....	4
4. Site survey of electrical equipment	4
4.1 General.....	4
4.2 Generators/motors	5
4.3 Switchboards and distribution boards (AC and DC)	5
4.4 Transformers (power and lighting)	5
4.5 Batteries/battery - Chargers/UPS	6
4.6 Cables	6
4.7 Lighting and small power sub-circuit and socket outlets	6
4.8 Earthing	6
4.9 Electrical panels (lighting, mimic panel, packages)	7
4.10 Public address, navigational aids	7
4.11 Essential/emergency supplies.....	7
4.12 Electrical safety kit	7
4.13 Technical rooms (electrical/instrumentation/telecommunications)	8
4.14 Heat tracing	8
4.15 Miscellaneous (control stations, solar panels, thermoelectric generators, etc.)	8
4.16 Emergency Shut Down system (ESD).....	8
5. Reporting	8



1. Scope

The **third party** shall inspect the electrical facilities with regards to **safety aspect for personnel and equipment**, prior to permanent energization.

The **third party** shall supply his services independently of the inspections and checks directly made by COMPANY or its representatives, even if these services are duplicated.

The electrical inspection shall consist of:

- Documentation review and checking (including test certificates for equipment/materials in hazardous areas) at home office
- Site survey as described here below
- Tests mainly megger tests (at random) and earth continuity checks (all). These tests shall be carried out by the construction CONTRACTOR who will provide 1 to 2 helpers (to open/reclose the various junction boxes/terminal boxes/panels/etc.) under the **third party** responsibility. The adequate testing apparatus (megger and multi tester) shall be provided by the **third party**
- Final report issue.

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.

The electrical facilities have been designed and built in accordance with the current edition of the following documents, listed in order of precedence:

- Applicable IEC Publications
- Applicable CENELEC Standards
- Applicable recognised standards and codes (UTE, BS, VDE, etc.) when IEC Publications have not yet been issued
- Also NEMA standards may have been used for very specific items:
 - Thermoelectric generators (TEG)
 - US or Canadian motors
 - Turbogenerator packages when manufactured by American VENDORS
 - Electrical cubicles (process heater, etc.)
 - Etc.

Standards

Reference	Title
Not applicable	

Professional Documents

Reference	Title
Not applicable	

Regulations

Reference	Title
Not applicable	

Codes

Reference	Title
Not applicable	

Other documents

Reference	Title
	Refer to the project electrical drawing index

Total General Specifications

Reference	Title
Not applicable	

3. General

The **third party** shall carry out an independent electrical inspection of all the electrical facilities as described in the purchase order documents.

This inspection shall be carried out at the end of the construction/beginning of the commissioning and shall be considered as the “initial verification” of the electrical facilities.

The **third party** shall be an independent society, worldwide recognised. The **third party** shall not be a construction CONTRACTOR, an engineering COMPANY or a services COMPANY or the COMPANY commissioning team.

4. Site survey of electrical equipment

4.1 General

- Check for tagging and labelling of all the electrical equipment and circuits
- Check for isolation and emergency stop devices of the electrical system
- Check for proper permanent display of one line diagrams and operating instructions in electrical rooms

- Check for proper fixation and mechanical appearance of all the electrical equipment
- Check for adequate isolation of all live parts, and proper segregation between power and control circuits.

4.2 Generators/motors

- Review of certificate of inspection at works
- Check suitability with area classification and weather protection (IP)
- Check wiring and terminations arrangement
- Check protective devices
- Check cooling/heating system
- Check megger tests
- Check foundation of equipment.

4.3 Switchboards and distribution boards (AC and DC)

- Review of certificate of inspection at works
- Check suitability with area classification and weather protection (IP)
- Check switch gear type and ratings
- Check earth fault protection devices
- Check operation of protective devices
- Check megger tests
- Check all the interlocking system and key operation system, as well as the written procedures
- Check and test the switchboard permanent insulation monitoring system
- Check relay and fuse settings (visual inspection)
- Check circuits with class II materials (double isolation)
- Check circuits incorporating safety transformers (very low voltage).

4.4 Transformers (power and lighting)

- Review of certificate of inspection at works
- Check suitability with area classification and weather protection (IP)
- Check for transformer oil leakage and oil level
- Check wiring and terminations arrangement
- Check for air drying device (breathing transformer)
- Check for insulator cleanliness
- Check operation of protective devices (temperature/pressure)

- Check continuity tests
- Check megger tests.

4.5 Batteries/battery - Chargers/UPS

- Review of certificate of inspection at works
- Check tightening of connections
- Check charging and switch-over arrangement
- Check the ventilation system
- Check battery autonomy (half battery per half battery).

4.6 Cables

- Check of certificate of inspection at works
- Check suitability with area classification
- Check of supports and cable trays
- Check of buried cable installation conditions
- Check of cable installation (bending radius, terminations, tying, labelling, spacing between cables)
- Check of multicables transits (MCT)
- Check of junctions boxes and cable glanding
- Check of terminals tightening, labelling and armour grounding
- Check all cables are at least flame retardant and cables for emergency services as listed in COMPANY specifications are of fire resistant type. Also when required in the COMPANY specifications, check cables for zero or low halogen design (smoke emission)
- Check megger tests.

4.7 Lighting and small power sub-circuit and socket outlets

- Check suitability with area classification and weather protection (IP) (lighting fitting, socket outlet, junction boxes)
- Check emergency lighting vis a vis escape ways (indoor and outdoor)
- Check beaconing on cranes, telemetry tower, etc.
- Check connection boxes, fuses, terminals, earthing
- Check socket outlets
- Check megger tests.

4.8 Earthing

- Check all the electrical equipment earthing (transformers, switchboards, motors, panels, etc.)
- Check network system (earthing rods, earthing conductors, etc.)

- Check junction boxes and lighting fittings (at random)
- Check earth loop and bonding to structures
- Check carefully earthing for the living platform or base camp including especially plumbing earthing in bathroom, in kitchen, etc.
- Check connections
- Check soldering, bolting, clamping
- Check neutral connections and earth resistors
- Check lightning arrestor and connections to earth
- Check surge diverters
- Check electrical measurements (earth resistance, continuity, etc.)
- Check and operate all the earth leakage circuit breakers.

4.9 Electrical panels (lighting, mimic panel, packages)

- Check suitability with area classification and weather protection (IP)
- Check electrical supply (cabling, wiring, connections)
- Check earthing and bonding.

4.10 Public address, navigational aids

- Check suitability with area classification and weather protection (IP)
- Check power sources (including change-over arrangements) cabling and switchgear associated control circuit
- Check electrical tests as applicable
- Check operation tests as applicable.

4.11 Essential/emergency supplies

- Review of certificate of inspection at works
- Review conditions and operation of transitional source of essential/emergency power as applicable
- Review essential and emergency switchboards and circuits as per 4.3 above
- Witness operations including change-over tests from normal power to emergency/essential power and vice versa as applicable.

4.12 Electrical safety kit

- Check number and types of safety devices (stool, mat, gloves, insulating poles, etc.)
- Check all the warning plates, safety labels, door posters for electrical rooms
- Check fire fighting system in technical rooms.

4.13 Technical rooms (electrical/instrumentation/telecommunications)

- Check for cleanliness, temperature, humidity and inappropriate storage of materials of the rooms
- Check normal and emergency lighting
- Check doors closing and opening from inside (with anti-panic bars)
- Check suitability with area classification of all the electrical apparatus installed in battery rooms.

4.14 Heat tracing

- Check suitability of equipment (heating elements, thermostats, junction boxes) with area classification
- Check junction boxes (connections, earthing)
- Check megger tests.

4.15 Miscellaneous (control stations, solar panels, thermoelectric generators, etc.)

- Check suitability of equipment with area classification and weather protection (IP).

4.16 Emergency Shut Down system (ESD)

This system includes the electrical isolation system upon an ESD level 0 or 1 in offshore projects.

- Check suitability of equipment with area classification (e.g. battery circuit breakers enclosed in Ex “d” boxes, power supply to pressurization system, post-lubrication system for large machines, etc.)
- Check good condition of safety sensors cables, wiring
- Witness electrical test as applicable of ESD system (electrical isolation effectiveness).

5. Reporting

The **third party** shall issue a punch list with detailed items to be cleared, a comprehensive list of tests which have been done effectively (supervised) by the **third party** and a final certificate of compliance. This certificate of compliance shall be issued “subject to qualifications clearance”.