



Exploration & Production

GENERAL SPECIFICATION

ELECTRICAL

GS EP ELE 451

THIRD PARTY inspection
Independent verification of electrical facilities

03	10/08	General review
02	10/05	Addition of "EP" root to GS identification
01	09/03	Change of Group name and logo
00	03/01	First issue
Rev.	Date	Notes



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1. Scope

This general specification provides requirement for initial verification, by inspection and testing, of an electrical installation by a **THIRD PARTY**.

The initial verification shall take place upon completion of a new installation or completion of additions or of major alterations to existing installations.

THIRD PARTY shall inspect the electrical facilities, including electrical distribution dedicated for instrumentation, with regards to **safety aspects for personnel and equipment**, on yard or on site prior energizing.

The electrical inspection shall consist of:

- Documentation review and checking as far as practical at third party's home office
- Site survey at the end of precommissioning and/or beginning of commissioning
- Final report

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 following order of precedence applies specifically to electrical equipment:

- Applicable laws, rules and regulations of the country in which the system will be operated. In cases where no "local" regulations exist, then French laws and regulations shall be used.
- Company Particular Specifications
- Company General Specifications
- Applicable International Electrotechnical Commission (IEC) standards
- Applicable European Standards by CENELEC
- Applicable recognised standards and codes (UTE, BS, VDE, Nema, etc.) when IEC Publications have not yet been issued

Standards

Reference	Title
IEC 60364-6	Low voltage electrical installation - Verification
IEC 61010 - 1	Safety requirements for electrical equipment for measurement, control and laboratory use – Part 1: General requirements
IEC 61010 - 031	Safety requirements for electrical equipment for measurement, control and laboratory use – Part 2-030: Special requirements for testing and measuring circuits
IEC 61326 - 2 - 2	Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 2-2: Particular requirements – Test configurations, operational conditions and performance criteria for portable test, measuring and monitoring equipment used in low voltage distribution systems
IEC 61326 - 2 - 4	Electrical equipment for measurement, control and laboratory use, - EMC requirements - Part 2: Particular requirements – Test configurations, operational conditions and performance criteria for insulation monitoring devices according to IEC 61557-8 and for equipment for insulation fault location according to IEC 61557-9
IEC 61557 - 1	Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. – Part 1: Equipment for testing, measuring or monitoring of protective measures –
IEC 61936 - 1	Power installations exceeding 1kV AC Part 1: Common rules

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
GS EP ELE 051	Design and installation of lightning protection

3. General requirements

COMPANY shall contract and manage **THIRD PARTY** inspection.

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.

CONTRACTOR shall make available all the necessary documents for the electrical verification by **THIRD PARTY**. In particular, all EC conformity declaration and instruction notice of equipment installed in hazardous area.

THIRD PARTY shall be an independent society, worldwide recognised. **THIRD PARTY** shall not be a construction **CONTRACTOR**, an engineering **company** or a services **company** or **COMPANY** commissioning team.

For floating units, the project classification society is not recognized as **THIRD PARTY** for purpose of this specification.

4. THIRD PARTY home office control

As a general rule, all work performed at third party home office shall be finalised by a check between study documents and installation on site.

4.1 Check drawings and calculation notes

As soon as possible **THIRD PARTY** shall check in his home office before the construction has started:

- Cable sizing calculation notes,
- Earthing grid sizing calculation and installation drawing,
- Network calculation notes (load flow, short circuit, harmonics) and protection relay setting booklet.

As a minimum, **CONTRACTOR** shall send to **THIRD PARTY** the following documents:

- Basis of Electrical System Design, Protection and Control Philosophy,
- Single line Diagrams,

- Area Classification Lay out,
- Earthing Grid Sizing Note,
- Referenced normative document list,
- Interlocking and Inter-tripping Diagrams,
- Load Flow and Short Circuit Calculations,
- Selectivity study and protection setting booklet,
- Cable Schedule,
- Cable Sizing Calculation note and Charts,
- Earthing and Lightning Layout,
- Typical Installation standard drawings (Earthing, Power, Lighting, Control),
- Project Particular Specifications,
- Equipment Data Sheets,
- Motor Starting Study,
- Electrical Lay out.

4.2 Inspection certificate at works

Inspection certificates at works shall be available on the construction yard for consultation by **THIRD PARTY**.

When required by **THIRD PARTY**, inspection certificates shall be sent to the third party office by **CONTRACTOR**.

5. Site survey

5.1 Visual inspection

At least visual inspection shall include:

- Method of protection against electric shocks (adequate isolation of all live parts, and proper segregation between power and control circuits),
- Presence of fire barriers and other precautions against :
 - fire propagation,
 - thermal effects,
- Choice and setting of protective and monitoring devices,
- Correct location of suitable isolating and switching devices (including for Emergency Shut Down),
- Selection of equipment and protective measures appropriate to external influences,
- Neutral and protective conductors correctly identified,
- Presence of diagrams, warning notices or other similar information,

- Identification of circuits, overcurrent protective devices, switches, terminals, etc...
- Adequacy of connection of conductors,
- Presence and adequacy of protective conductors, including main and supplementary equipotential bonding conductors,
- Accessibility of equipment for convenience of operation, identification and maintenance,
- Tagging and labelling conformity with drawings,
- Proper fixation and mechanical appearance,
- Isolation and Emergency Stop Devices

This item is mainly a check of existence and access to the Emergency Stop Device.

Test operation of Emergency Stop Devices shall not be performed by **THIRD PARTY**.

5.2 Testing

The adequate testing apparatus shall be provided by **THIRD PARTY** and in conformity with [IEC 61557-1](#).

CONTRACTOR shall provide helpers to open/close the various junction boxes/terminal boxes/panels/etc. The helper shall be driven by **THIRD PARTY**.

As a minimum, the following tests shall be carried out:

5.2.1 Insulation resistance test

The insulation resistance test shall be done below the maximum acceptable voltage.

Unless otherwise specified by manufacturer documents, the test voltage shall be 500V DC for control/command circuits and 1000V DC for low voltage power circuits.

The maximum test voltage shall be 5000V DC for high voltage network.

The third party inspector shall control several circuits with one measure when the global insulation is correct. In the other cases, the insulation test shall be individually done for each fault circuit.

5.2.2 Protective conductor continuity

THIRD PARTY shall test the continuity of the complete earthing network from the equipment to the main earthing loop.

As a minimum, **THIRD PARTY** shall check:

- All the electrical equipment earthing,
- Earthing network system (earthing rods, protective conductors, etc.)
- Bonding to structures,
- Earth resistance measure,
- Plumbing earthing in bathroom, in kitchen, etc...,
- Neutral connections and earth resistors,
- Connections to earth of lightning arrestors and surge diverters.

5.2.3 Other tests

- Measurement of the insulation resistance for protection by SELV (Safety Extra Low Voltage), PELV (Protective Extra Low Voltage) or by electrical separation,
- Automatic disconnection of supply (RCDs),
- Test of the order of the phases,
- Functional and operational tests as described in [IEC 60364-6](#),
- Voltage drop

6. Final reports

6.1 Final report draft

At the end of control and before leaving the construction yard or exploitation site:

- **THIRD PARTY** shall verbally submit the control results (major non conformities) for **COMPANY** or its Representative approval.
- **THIRD PARTY** shall give a first final draft document showing the main non conformities.

6.2 Complete final report

At least the complete final report shall be issued in one month after the end of control and it shall contain:

- A summary,
- An abbreviation notice,
- General information about the control (site name, control and redaction dates, inspector and **COMPANY** representative names, etc...),
- Control scope of work,
- The main electrical installation characteristics:
 - name and situation of each unities/technical room,
 - schematic site layout with all HV cabin and generators set,
 - for each generator (manufacturer, series number, power, voltage, short-circuit voltage),
 - for each HV/LV transformer (manufacturer, series number, power, primary and secondary voltage, coupling, short-circuit voltage, dielectric nature, overvoltage limiter, earthing system),
 - for each HV switchboard (manufacturer, series number, voltage, rated current, short time withstand current),
 - for each main LV switchboard (manufacturer, series number, voltage, rated current, short time withstand current),
 - earth resistance value (specified if it is connected or disconnected to earth network),
 - for each network the earthing system selected.
- The exhaustive list of referenced normative documents used

- The exhaustive list of checked equipments with:
 - apparatus tag and location,
 - rated current,
 - insulation class for class II and class III apparatus,
 - overcurrent protection value with type and calibration,
 - if any the non conformities with a specific numbering.
- The punch list of all non conformities with reference to relevant standards and the corrective actions to be done. The punch list shall have:
 - apparatus tag and location
 - the HV and LV in separated parts,
 - the same specific number as found in equipment check list for each non conformities,
- A detailed list of tests which have been done with:
 - measuring goal and methodology,
 - result evaluation criteria,
 - used testing apparatus (manufacturer and type),
 - value of each measure,
 - value unity,
 - status (conform or not).
- A final certificate of compliance.

Appendix 1

Items	Visual inspections								Testing			
	Tagging and labelling	Isolation and emergency stop devices (existence and access)	Proper fixation and mechanical appearance (visual)	Protection against electric shock	Insulator cleanliness	Tightening of connections (visual and not energized)	Changing and switch-over arrangement	Liquid leakage and level	Insulation tests	Earthing continuity tests	Operating Test	
Generators, motors, Solar panels, thermoelectric generators, etc.	☐	☐	☐	☐	☐	☐		☐	☐	☐		
Transformers (power and lighting)	☐		☐	☐	☐	☐		☐	☐	☐		
Safety transformers (very low voltage).	☐		☐	☐	☐	☐			☐	☐		
Technical rooms (electrical/instrumentation/telecommunications)	☐	☐	☐	☐	☐					☐		
Batteries – UPS's	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
Switchboards and distribution boards (AC and DC)	☐	☐	☐	☐	☐	☐	☐		☐	☐		
Electrical panels (lighting, mimic panel, packages)	☐	☐	☐	☐	☐	☐	☐		☐	☐		
Earth fault protections, permanent insulation monitoring,	☐	☐	☐	☐	☐	☐	☐		☐	☐	☐	
Circuit breakers, fuses, earth current limitation devices, etc.	☐	☐	☐	☐	☐	☐			☐	☐		
No electrical protective device (temperature, pressure, leakage, air drying etc...)	☐		☐	☐	☐	☐			☐	☐		
Cables trays	☐		☐		☐					☐		
Cables	☐		☐						☐			
Junction boxes	☐		☐	☐	☐	☐			☐	☐		
Transitional source of essential/emergency power	☐	☐	☐	☐	☐	☐			☐	☐		
Lighting and small power sub-circuit and socket outlets	☐	☐	☐	☐	☐	☐			☐	☐		
Normal lighting	☐		☐	☐	☐	☐			☐	☐		
Emergency lighting	☐		☐	☐	☐	☐			☐	☐	☐	
Interlocking system	☐	☐	☐		☐	☐			☐	☐	☐	
Cable gland, etc...			☐		☐					☐		
MCT	☐		☐		☐	☐						
Cathodic protection	☐		☐	☐	☐	☐			☐	☐		
Public address, navigational aids, beacon light	☐		☐	☐	☐	☐			☐	☐		
Electrical Heat tracing	☐		☐	☐	☐	☐			☐	☐		
Electrical safety kit			☐		☐						☐	
Structure, tubing, plumbing, etc...	☐	☐			☐					☐		