

 ISOICO	 PETROPARS	SOUTH PARS GAS FIELD DEVELOPMENT PHASE 11 EPCI Contract for Topside, Ancillaries and Tripods (SP11A)	 N.I.O.C. <i>Pars Oil & Gas Company</i>
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Specification for Electrical Bulk Material

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SOUTH PARS GAS FIELD DEVELOPMENT PHASE 11



N.I.O.C.
Pars Oil & Gas Company



EPCI Contract for Topside, Ancillaries and Tripods (SP11A)

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1. INTRODUCTION

1.1 General

The South Pars field is located in the Persian Gulf approximately 130 km South West of Assaluyeh and 175km West of Kish Island. The South Pars Phase 11 development facilities comprise 2 wellhead platforms named SP11A and SP11B and located around 70m water depth, two 32" sea lines associated with their 4" piggy-back returned lines, exporting the gas to the existing onshore plants. The Phase 11 development of the South Pars gas field (SP11A and SP11B) is designed for a production of 2000 MMSCFD of reservoir fluid (1000 MMSCFD for each SP11A and SP11B).

The development of SP11A is based on new 15 slots Wellhead platform and sea-line. The sea-line from SP11A Wellhead Platform (SPD11A) will send SP11A production to SP12 onshore facilities in TOMBAK via the 32" sea line. When the field starts to be depleted, a compression phase will be implemented (out of Project SOW).

In addition to the wellhead platform (SPD), a Relief platform (RP), equipped with a vertical Flare, will be connected by 2 bridges (BR1 & BR2) to the SP11A platform for personnel access. One Bridge Support Platform (BSP), supports the two bridges that allow access from SPD to RP. Typically, The SP11A Platform consists of:

1. The wellhead platform dedicated to drilling with a jack-up rig. [SPD]
2. The Relief platform, which is equipped with a vertical Flare. [RP]
3. The Bridge Support Platform [BSP]
4. The two Bridges, which connect SPD to RP through BSP [BR1, BR2]

Iran Shipbuilding & Offshore Industries Complex Co. known as ISOICO (CONTRACTOR) has been awarded to conduct and to perform the Engineering, Procurement, Supply, Fabrication, Construction, Load Out, Sea Fastening, Transportation and Installation of the SP11A Wellhead topside, ancillaries and Tripods and the commissioning of installed equipment on it, hereinafter referred to as "Project".

Scope of SLT International (ENGINEER) involvement in the Project is detail design engineering and procurement engineering services.

1.2 Purpose of the Document

This specification covers the minimum requirements for design and installation of Electrical Bulk items including, cable glands, junction boxes, conduits, Multi-Cable Transits, Certified Photocells, lighting poles, Certified Socket Outlets and Plugs for offshore facilities of South Pars Gas Field Development Phase 11.

Installations concerned are the wellhead platforms named SPD11A, and its respective bridge and flare platform, RP11A.

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1.3 Key Definitions

OWNER	National Iranian Oil COMPANY (NIOC) Pars Oil and Gas COMPANY (POGC)
COMPANY	Petropars Ltd. (PPL)
CONTRACTOR	Iran Shipbuilding & Offshore Industries Complex Co. (ISOICO)
ENGINEER	SLT International;
VENDOR	Shall be considered to be synonymous with the term SUPPLIER as defined below
SUPPLIER	Firm or corporation who submit a quotation for the supply of the equipm equipment
PURCHASER	Party who receives the quotation from the SUPPLIER

1.4 Abbreviations

NIOC	National Iranian Oil Company;
POGC	Pars Oil & Gas Company;
PPL	Petro Pars Ltd.;
ISOICO	Iran Shipbuilding & Offshore Industries Complex Co;
SLT	SLT International;
DDE	Detailed Design Engineering;
SOW	Scope Of Work;
TBA	To Be Advised;
TBC	To Be Confirmed;
WHP	Well Head Platform;
AC	Alternating Current
CT	Current Transformers
DC	Direct Current
DLE	Dry Low Emissions
DG	Diesel Generator Package XX20-U-101 A or B
DVT	Design Validation Test
ESD	Emergency Shutdown
FAT	Factory Acceptance Test
FGS	Fire and Gas System
GPA	General Platform Alarm

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HVAC	Heating Ventilation and Air Conditioning
ICSS	Integrated Control and Safety Systems (Global) including PCS, PSS, ESD & Fire and Gas system
ITP	Inspection and Test Plan
NAVAIDS	Navigation Aids
HMI	Human Machine Interface
PCS	Process Control System
PDC	Power Distribution Control
PGCS	Power Generation Control System
PLC	Programmable Logic Controller
PSS	Plant Safety System
SPIR	Spare Parts Interchangeably Record
SSS	Safety Shutdown System
UCP	Unit Control Panel
UPS	Uninterruptible Power Supply
VDRS	Vendor Document Requirement Schedule
WP	Wellhead Platform
WPTR	Wellhead Platform Technical Room

1.5 References

All work specified shall be in accordance with all applicable sections of the latest edition of the Standards, Professional Documents, Regulations and Codes (and their current amendments) listed below and in the applicable TOTAL General Specifications, and shall form an integral part of this project.

1.5.1 Codes and Standards

<u>Item</u>	<u>Standard</u>	<u>Description</u>
[1]	IEC 60038	IEC standard voltages
[2]	IEC 60079	Electrical apparatus for explosive gas atmospheres
[3]	IEC 60083	Plugs and socket outlets for domestic and similar general use
[4]	IEC 60092-390	Electrical installations in ships
[5]	IEC 60309	Plugs, socket-outlets and couplers for industrial purposes

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[6]	IEC 60439-3	Low-voltage switchgear and control gear assemblies Part 3: Particular requirements for low-voltage switchgear and control gear assemblies intended to be installed in places where unskilled persons have access for their use - Distribution boards
[7]	IEC 60446	Basic and safety principles for man-machine interface, marking and identification - Identification of conductors by colours or numerals
[8]	IEC 60529	Degrees of protection provided by enclosures (IP Code)
[9]	IEC 60755	General requirements for residual current operated protective devices
[10]	IEC 60617	Graphic symbols for Electrical diagrams
[11]	IEC 60695	Fire Hazard testing of Electro technical products, Part 390: Cable penetrations -Fire type test procedures
[12]	IEC 60947	Low-voltage switchgear and control gear

1.5.2 Project References

[13] Electrical Design Philosophy	SP11-10-D-15-5-001
[14] Specification for Equipment Design Conditions	SP11-10-D-10-4-005
[15] Specification for Packing, Marking and Shipping	SP11-10-D-10-4-001
[16] Electrical Requirements for Package Units	SP11-10-D-15-4-039
[17] Specification for Spare Parts Requirements	SP11-10-D-10-4-002
[18] Specification for Painting & Coating	SP11-10-D-21-4-021

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2. FACILITY DESCRIPTION

The SP11A gas field shall be developed to produce 1000 MMSCFD reservoir fluid to supply gas to Tombak (SP 12 part) with a 32" export pipeline.

The SPD11A wellhead platform consist of a four-legged jacket substructure and a topside consist of a truss-framed structure. Facilities to be designed during the engineering phase are as follows.

2.1 Jacket Tripods

Tripods facilities to be installed at SP11A location are as follows:

- Tripod support structure for Bridge Support Platform, including piling (BSP 11A);
- Tripod support structure for Flare Support Platform, including piling (RP 11A);

2.2 Topside and ancillaries

A brief description of topside facilities to be installation at SPD11A location is as follows:

- 1) One WHP (SPD11A) with 15 slots; with below main equipment:
 - Well Heads;
 - Production/Test manifold;
 - Test separator;
 - Export metering system;
 - Scraper launcher;
 - HP relief KO drum;
 - Closed drain/LP flare drum;
 - Open drain system;
- 2) Associated utilities (Diesel, MEG, Methanol, KHI, Chemicals, Nitrogen, Fresh Water);
- 3) One Relief Platform (RP), including deck and flare tower, installed on the RP11A being connected by bridge to BSP11A;
- 4) One Deck installed on the BSP11A, being connected by bridges to the wellhead platform and RP11A;
- 5) Two bridges connecting SPD11A to BSP11A and BSP to RP11A;

2.3 Onshore Facilities

An Onshore Facility after sealine onshore tie-in that includes:

- Valve station;
- Pig Receiver;
- Onshore pipeline to Phase 12 Plant;
- ICSS and Telecommunication;

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3. DESIGN AND CONSTRUCTION REQUIREMENTS

3.1 Cable Glands

Cable glands, blanking's and drain plugs shall be made of Nickel-plated brass or stainless steel (AISI 316).

Cable glands shall have ISO metric threads to IEC 60423, and the thread sizes shall be as specified in the requisition.

All cable glands shall be suitable for use in Zone 1 area. Non-certified glands shall not be used anywhere.

Armor clamping type glands shall be used. The cable gland shall be double sealing type suitable for relevant armoured cables. Also, lock nut and earth tag shall be provided by VENDOR.

All glands shall be complete with locknuts and nylon washers to maintain the IP rating of the equipment into which the glands/plugs are connected.

Gland entries into non-metallic enclosures with clearance holes must be retained with lock nut and serrated washer, and shall include a sealing washer on the gland body side of the entry to maintain the enclosure IP rating.

Shrouds shall be used on all cable glands.

3.2 Junction Boxes (JB)

Outdoor Junction Boxes shall be minimum IP55 and EExe (increased safety) or EExd (flame proof) suitable for hazardous areas.

Indoor Junction boxes shall be industrial type with the degree of protection of IP42.

Cable entries (ISO threaded) and terminals shall be suitable for the cables specified in the requisition.

The junction boxes shall be suitable for mounting on steel structure/column/wall. Installation hardware and accessories shall be supplied by Vendor.

Junction boxes shall be GRP IMPACT or stainless steel 316 grade.

The outdoor enclosures shall be suitable for wall and steel column/structure mounting.

Terminals shall be adequately rated for the cable conductor size and current rating.

The junction boxes shall be provided completely with terminals, mounting rails, end plates, marking strips or tags, etc., when so specified in the requisition.

Outside identification plates shall be corrosion proof by nature (stainless steel) and securely fixed to enclosure (not glued).

3.3 Conduits

Above grade conduit shall be hot dip galvanized rigid steel, heavy gauge, solid drawn (seamless) with metric threads of ISO form according to IEC 60423 or BS 4568.

The minimum size of the above grade conduit shall be 20mm trade size.

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Flexible conduits shall be liquid tight and suitable for the area classification in which they are installed. Flexible conduits shall be used to connect vibrating equipment and instruments.

3.4 Multi-Cable Transits

Multi-cable transits shall always be used where cables have to pass:

- Through walls, roofs and floors of safe pressurized enclosures or rooms to open hazardous areas, separated by a gas-tight wall or barrier
- Through blast walls or fire walls, or through solid decks

Multi-cable transit frames shall be fire / blast rated to the same standard as the fire / blast walls.

Multi-cable transits are to be either a rectangular or circular frame constructed from a minimum of marine grade hot dip galvanized mild steel, aluminum or stainless steel depending on the type of material it is to be fixed into. All transit frames shall be suitable for direct welding to the wall/roof. Bolted flange type transit frames shall not be used.

Cable insert blocks are to be manufactured from halogen free, non-flammable, intumescent elastomeric polymer. They are to be made available in module sizes from 15mm to 120mm and to be able to seal cables from 3mm to 100mm in diameter without additional modification on installation.

Each size of block is to tolerate and seal a 3mm variation in cable size. The individual block halves are to be clearly colour coded with the minimum and maximum cable diameter which it is designed to seal clearly identified on both external surfaces to ensure correct installation and inspection.

Each pair of block halves is to be manufactured incorporating sealing grooves along the internal faces to enable displacement of spare material around the cable when under compression to ensure gas tight and water tight sealing.

Stay plates are to be manufactured from brass or stainless steel and inserted between horizontal rows of cable insert blocks within the steel frame itself. Where pressure in excess of 3.5 bar is expected, stay plates, which have been suitably tested, are to be used together with an additional 5mm packing strip for increased compression.

The compression system is to comprise of a compression plate and end-packer. The three-part end packer unit is to be installed from one side, and only once an external compression tool has correctly compressed the transit. The side elements of the end packer are to incorporate steel pins to evenly distribute pressure to the compression plate.

All components of the transit system are to be lubricated with a silicone lubricant to ensure ease of installation and possible future demounting for cable alterations.

Where electromagnetic compatibility is required, the transit system is to meet the requirements of respective standards.

Multi-cable transits shall have the following certification requirements: Constructed and tested to IEC 60092-390

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3.5 Entries and Plugs

In case of using blank entries for LCS, JB, socket or any explosion proof device, the blank entries shall be equipped with Ex d plugs and supplied by VENDOR.

3.6 Certified Photocells/lighting poles

Photocell units are used for switching of general outdoor area lighting and shall be designed and constructed for a minimum of 5A, 200/250V and 50Hz.

The minimum certification requirements for photocell units installed in a hazardous outdoor area shall be as follows:

- Area Classification Zone 1 Group IIB T3
- Protection Type Ex "d"
- Ingress Protection IP55

Photo-cell units shall not be sensitive to operation under lightning or lightly clouded skies and also shall be of fault safe type, so that the load circuit remains energized in the event of electronic circuit failure.

Lighting poles shall be [Hot Dip Galvanized or Stainless steel](#) pipe sch.80.

3.7 Certified Socket Outlets and Plugs

A minimum of one plug shall be provided with each socket outlet, unless indicated otherwise.

The minimum certification requirements for socket outlets and plugs installed in a hazardous outdoor area shall be as follows:

- Area Classification Zone 2 Group IIB T3
- Protection Type Ex 'de'
- Ingress Protection IP55 with plug inserted

The minimum enclosure construction requirements for socket outlets shall be non-metallic of glass reinforced polyester (GRP) impact, UV and oil resistant materials.

Socket outlet enclosures shall be suitable for wall and steel column/structure mounting with bolted on cover. The socket outlet enclosure shall be provided complete with the mounting accessories as required.

All socket outlets shall be provided with spring loaded flaps to protect them from the weather and the entry of insects whilst the plug is removed.

All cable glands entering into the socket outlet enclosure shall do so through threaded entries. Threaded entries shall be ISO metric tapped and located on the bottom of the enclosure.

All unused entries through "Ex" certified enclosures for hazardous areas shall be sealed with suitably certified plugs. Plugs for Ex d enclosures shall have at least five (5) threads engaged in the entry, and a minimum axial thread length of 8mm to ensure the certification is maintained. All plugs shall be component certified Ex d type and shall comply with the requirements of IEC 60079.1 and IEC 60079.7. All plugs shall maintain the ingress protection (IP) of the equipment.

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All socket outlets, plugs and couplers shall be colour coded according to system voltage as per below table.

System Voltage	Colour
400V	Red
230V	Blue

Socket outlets, plugs and couplers of different voltages shall not be interchangeable.

The looping facilities are required.

Terminations shall be of the crimped connection or compression type. Pinching screws or soldered lugs shall not be used.

Each socket outlet shall be fitted with an earth terminal that is connected to the earth core of the incoming power cable. All metal parts (other than the current carrying components) of the socket shall be electrically bonded together and connected to the earth terminal.

The material of contacts shall be brass nickel plated.

3.7.1 Single Phase Socket Outlets

Single phase socket outlets shall have the following configuration:

- Current Rating 16A
- Voltage 230V @ 50Hz
- No. of Poles 2 Switched (Active and Neutral) and Earth
- No. of Pin Entries 3
- Pin configuration as per the Project Material Requisition
- Handle Actuator Lockable Yes

Single phase socket outlets shall include integral interlocked circuit switches, to disconnect the voltage before the pin contacts can separate. When inserting a socket, the interlock shall ensure that the contacts are not energized until the plug has been fully inserted. The switching capacity shall be at least 16A AC-3 at 690V to IEC 60947-3.

3.7.2 Multi-Phase Socket Outlets

Multi-phase socket outlets shall have the following configuration:

- Current Rating 63A
- Voltage 400V @ 50Hz
- No. of Poles 4 Switched (3 Phases and Neutral) and Earth
- No. of Pin Entries 5
- Pin configuration as per the Project Material Requisition
- Handle Actuator Lockable Yes

