

Sudatel Telecom Group
Technology Planning and Deployments
Power Infrastructure

REQUEST FOR PROPOSALS Part B
Technical Specifications

Tier 3 Power Plant Project _ Wadi Halfa Core

1. Scope of Work

Project: Tier 3 Power Plant Supplying, Installing, Testing and Commissioning of power plant.
Location: Wadi Halfa Core- Northern Region.

2. Project Overview

This Scope of Work defines the supplying, installing, testing and commissioning of new open generators set , synch panel, MDBs, AVS, PFC, PDUs , spare parts and installation material at site Wadi-Halfa Northern Sudan, to meet tier 3 requirement.

All equipment will be installed in underground building.

3. Scope of Goods:

3.1 Supply of Generators:

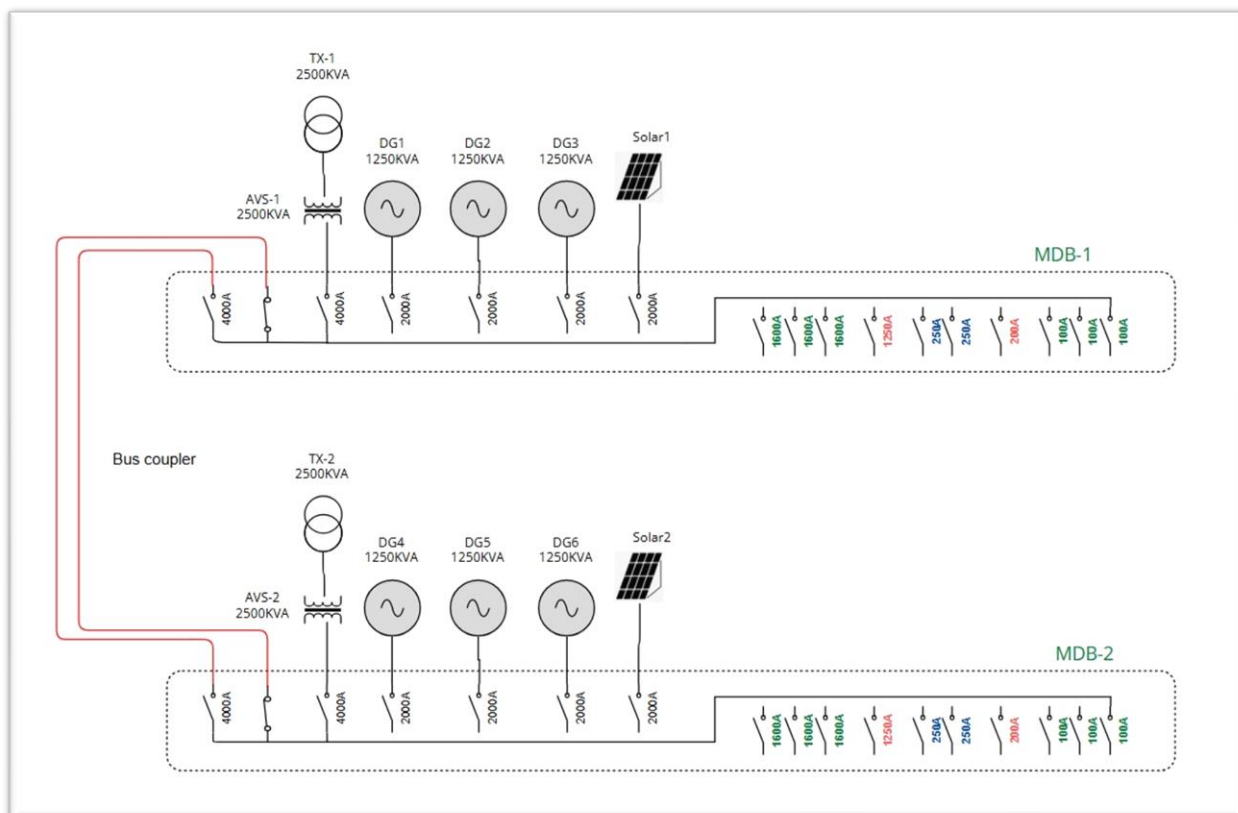
- 3.1.1 Caterpillar Generators, Capacity **4*1250 KVA @50°C /1000 m A.S.L prime power (considering the derating of engine if it has).**
- 3.1.2 Open set generators type with daily fuel tanks., with fuel sensor.
- 3.1.3 Water cooled generators.
- 3.1.4 Engine brands shall be caterpillar.
- 3.1.5 Alternator brand caterpillar.
- 3.1.6 Engine Controller.
- 3.1.7 Generator controller.
- 3.1.8 Remote monitoring and control support module.
- 3.1.9 External fuel purifier for each generator.
- 3.1.10 Daily fuel tank and auto refill system for each genset.
- 3.1.11 Radiator exhaust ducting system.
- 3.1.12 Engine exhaust manifold piping system.
- 3.1.13 Genset antivibration mounts.

3.2 Supply of Synchronization Panel:

- 3.2.1 Two Synch panels ready for future expansion to add One DG and solar inputs to each panel.
- 3.2.2 Synch Panel 1, at Source1 (Operation logic to synchronize Transformer, Solar & 3 Genset).
- 3.2.3 Synch Panel 2, at Source2 (Operation logic to synchronize Transformer, Solar & 3 Genset).
- 3.2.4 Two Redundant Bus Couplers between Synch Panel 1&2.
- 3.2.5 The two Synch Panels and redundant bus couplers, All MDBs based on ABB brand.
- 3.2.6 ComAp panels Controllers.
- 3.2.7 Motorized CBs.
- 3.2.8 MDB1 for Source-1, consisting of Incomers,1*4000A+4*2000A, Outgoing 3*1600A+ 1*1250A+2*250A+1*200A +3*100A at control room1.
- 3.2.9 MDB2 for Source-2 consisting of Incomers,1*4000A+4*2000A, Outgoing 3*1600A+ 1*1250A+2*250A+1*200A +3*100A at control room2.

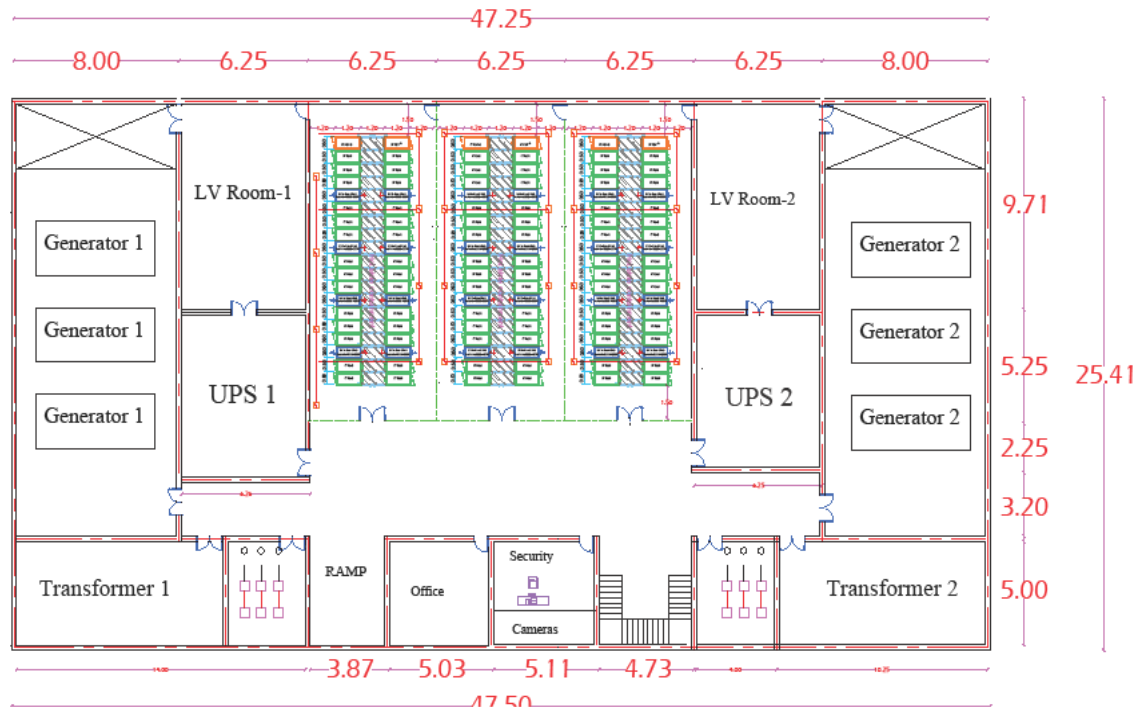
3.3 Supply of Additional Equipment and Installation Material:

- 3.3.1 Additional 4 PDUs (2 for UPS Room1 & 2 for UPS Room 2) each consist of:
Income:1*1600A.
Outgoing: (1*1250A, 1*800A+1*250A).
- 3.3.2 Automatic Voltage Stabilizer (AVS), 2*2500KVA.
- 3.3.3 Manual Bypass switch 3P+N, rating 3600 A, for AVS 1&2.
- 3.3.4 Power Factor Correction (PFC) with high quality capacitors, 2*1000 KVAR
- 3.3.5 Power cables from transformers 1&2 to AVS 1 &2.
- 3.3.6 Power cables between the Transformer, Bypass Switch and AVS 1&2.
- 3.3.7 Power cables from AVS 1&2 to panel 1 &2.
- 3.3.8 Power cables from generator 1 &2 to power room 1.
- 3.3.9 Power cables from generator3 &4 to power room 2.
- 3.3.10 Power cables from panel 1&2 to PFC 1 &2.
- 3.3.11 Power cables for redundant bus coupler between power room 1&2.
- 3.3.12 Power cables from control room 1 to PDU 1&2 inside UPS Room1.
- 3.3.13 Power cables from control room 2 to PDU 3&4 inside the UPS Room2.
- 3.3.14 Complete earthing system and provide earth busbar & earth cables.
- 3.3.15 Required cable Accessories.
- 3.3.16 Type B SPD (surge protection device) in each panel.
- 3.3.17 Any additional requirement not mentioned above.
- 3.3.18 Below Single Line Diagram showing the details:



The Single line Diagram

3.3.19 Below Site Plan-Basement Floor details:



4. System Operation Logics:

4.1 Solar operation logic:

- 4.1.1 During daylight and solar power available the solar system is synchronized with the other inputs and supply the load.
- 4.1.2 When the solar power is less than load demand and MAINS available, SOLAR & MAINS supply the load simultaneously.
- 4.1.3 When the solar power is less than load demand and MAINS not available, SOLAR & DG supply the load simultaneously.
- 4.1.4 When the solar power is not available, the load directly supplied either from MAINS or DG.

4.2 Bus coupler Operation:

- 4.2.1 Two bus couplers are redundant to each other.
- 4.2.2 Two bus couplers should operate in auto and manual mode.
- 4.2.3 If one synch panel fail the bus coupler should operate and supply the load.
- 4.2.4 If one transformer fails, the bus coupler should operate and supply the load from the other transformer.
- 4.2.5 If one genset group fails, the bus coupler should operate and supply the load from the other genset group.

- 4.2.6 If one unit fails from genset group, the bus coupler should operate and synchronize the other unit with the other genset group if needed to supply the load

5. Scope of Service:

5.1 Scope of Main Services (Activity-Job):

Installation, Testing and Commissioning of:

- 5.1.1 Auto/Manual operation for the whole system.
- 5.1.2 Simulate commissioning of coming up ac solar input & DG synchronization.
- 5.1.3 4*1250KVA Gensets.
- 5.1.4 External fuel purifiers and daily fuel tank auto refill.
- 5.1.5 Fuel piping system for each genset.
- 5.1.6 Two Synch panels and MDB 1&2 in room1 &2.
- 5.1.7 Two AVS system.
- 5.1.8 Two bypass switches.
- 5.1.9 Two PFC systems.
- 5.1.10 4 PDUs in UPS Room 1&2.
- 5.1.11 Power cables from transformers 1&2 to AVS 1 &2.
- 5.1.12 Power cables between the Transformer, Bypass Switch and AVS 1&2.
- 5.1.13 Power cables from AVS 1&2 to panel 1 &2.
- 5.1.14 Power cables from generator1 &2 to power room 1.
- 5.1.15 Power cables from generator1 &2 to power room 2.
- 5.1.16 Power cables from panel 1&2 to PFC 1 &2.
- 5.1.17 Power cables for redundant bus coupler between power room 1&2.
- 5.1.18 Power cables from control room 1 to PDU 1&2 inside the UPS Room1.
- 5.1.19 Power cables from control room 2 to PDU 3&4 inside the UPS Room2.
- 5.1.20 Control cables.
- 5.1.21 Install earthing system, earth busbar & earth cables.
- 5.1.22 Provide and install required accessories to connect the external fuel tank with the generators.
- 5.1.23 Configure the remote monitoring module parameters for all the systems.

5.2 Scope of Spare Parts – optional

Provide critical spare parts:

- 5.2.1 1 *CB 4000 Amps spares
- 5.2.2 2 *CB 2000 Amps spares
- 5.2.3 2 *CB 1600 Amps spares.
- 5.2.4 1* programmed ComAp spares for each type (3 pcs in total)

5.3 Mandatory operation spare parts :

- 5.3.1 Normal 2000 hrs. operation spare parts.

6. Scope of Training and Acceptance:

6.1 Factory visit and Acceptance Test:

- 6.1.1 Factory visit and acceptance test for the gensets and panels for (6) engineers, for genset and panels for different factory locations.

6.2 Intensive operation training on:

- 6.2.1 The targeted numbers of participation are (5) engineers from sudatel.
- 6.2.2 Genset and panels.

- 6.2.3 ComAP controllers.
- 6.2.4 Remote monitoring.

7. Other Mandatory Requirements:

7.1 Warranty:

- 7.1.1 **Warranty** period shall be stated with each equipment as per standard.
- 7.1.2 Warranty for generators is not less than 2000 hours of operations or 18 months, which comes first.

7.2 Delivery

- 7.2.1 Delivery time should be as fast as possible, not more than 5 months as maximum.
- 7.2.2 Delivery location is sudatel warehouse at Port Sudan.
- 7.2.3 Delivery time shall be started from the PO signed off.

7.3 Testing and Commissioning

- 7.3.1 Pre-commissioning.
- 7.3.2 Load testing and functional performance verification.
- 7.3.3 Fuel system test.
- 7.3.4 Submission of commissioning report and as-built drawings.

7.4 Documentations

- 7.4.1 Complete technical data sheet for each part.
- 7.4.2 Operation and maintenance manuals.
- 7.4.3 Derating curves and charts for generators.
- 7.4.4 Warranty certificates.
- 7.4.5 Compliance table.

7.5 Compliance and Standards

- 7.5.1 All equipment and workmanship must conform to international standards (e.g., ISO, IEC) and local Sudanese regulations.
- 7.5.2 CE, IEC 61000 (EMC), IEC 60947-6-2 (automatic transfer & switching equipment), or equivalent international standards.
- 7.5.3 Compliance with local utility/grid requirements.
- 7.5.4 Meets IEC 61643 surge protection standards.

7.6 Guarantee

- 7.6.1 The supplier should guarantee that all design and engineering is done to generally accepted standards for industry and at a minimum in accordance with the specifications referenced.
- 7.6.2 The supplier shall guarantee that, the equipment is new and free from defects in design, workman and material and it has been correctly applied, installed, and tested.
- 7.6.3 The supplier shall replace at his own expense any part proving defective within Twelve (12) months of the date of initial use of the equipment.
- 7.6.4 The supplier should advise SUDATEL well ahead of time if the production of the purchased equipment is to be terminated due to technological change or any other

reason so that adequate stock can be held by SUDATEL. This shall not happen in the first 10 years of the equipment's life.

7.7 Fill out the Compliance table below

Item no.	Item	Comply/partially comply/ Not comply	Remarks
1	Generators		
	Brand		
	Model		
	Capacity		
	Cooling		
2	Engine		
	Type		
	Model		
	Brand		
3	Alternator		
	Brand		
	Model		
4	Control system		
	Type		
	Features		
	Remote monitoring		
	Able to integrate with existing management system		
5	Fuel system		
	Daily fuel tank capacity (L)		
	Fuel consumption 100%		
	Fuel consumption 75%		
	Fuel consumption 50%		
	Fuel consumption 25%		
	Fuel purification system		
	Fuel connection system		
	Fuel Sensor		
6	Sound Level		
7	Battery Charger		
8	Synch. Panel		
	Capacity		
	Brand		
	Model		
9	PDU's		
	Rating		
	Model		

	Brand		
10	MDBS		
	Rating		
	Model		
	Brand		
11	Automatic Voltage stabilizer		
	Brand		
	Model		
	Capacity		
	Cooling		
12	Power Factor		
	Capacity		
	Brand		
	Model		
13	Bypass switch		
	Capacity		
	Rating		
	Brand		
14	Cables & installation materials		
	Brand		
	Quantity		
	Surge Protection Device		
15		Scope Of Service	
	Deployment		
	Test		
	Commissioning		
	Spare parts		
	Training		
	Factory Acceptance		
	Earthing system deployment		
	Fuel piping system		
	Radiator exhaust ducting system		
	Engine exhaust manifold piping system		
16	Other Mandatory Requirements		
	Warranty		
	Delivery time		
	Grantee		
	Documentations		

Table Of Compliance

8. Supplier's General Responsibilities

8.1 Marking:

- 8.1.1 Each unit and sub-assembly of equipment shall have their type, model and serial number clearly and suitably labeled.
- 8.1.2 All electrical components of equipment shall be clearly marked in conformity with the coding used in the manufacturer's drawings and diagrams.
- 8.1.3 Labels shall be preferably riveted or screwed in position and not held solely by adhesive.

9. Environmental Conditions:

- 9.1 Ambient Temperature 0-50°C
- 9.2 Relative Humidity up to 95%
- 9.3 Altitude 0- 2000 m ASL.
- 9.4 Outdoor equipment IP65 should be if any.

10. Power Supply and Earthing & Safety Requirements

The supplier shall design and install new earth system at site.

- 10.1 The new earth system shall cover the existing and new equipment.
- 10.2 Shall comply with standard measurements.
- 10.3 The supplier shall state protective measures taken to prevent damage to equipment.
- 10.4 All live parts that may cause currents dangerous to human life shall be fully protected to avoid accidental contact.
- 10.5 Equipment should be constructed to minimize fire spread by using flame and fireproof components and materials.
- 10.6 The supplier shall guarantee that replacement components and replacement panels and units shall be available to cover maintenance requirements for a period of 15 years after the contract date. Price escalation formula shall be given for future supplies.
- 10.7 The supplier should advise SUDATEL well ahead of time if the production of the purchased equipment is to be terminated due to technological change or any other reason so that adequate stock can be held by SUDATEL. This shall not happen in the first 10 years of the equipment's life.

11. After-sales services

- 11.1 The bidder shall present his/her capability of after sales which includes:
- 11.2 Local technical support.
- 11.3 Automated fully equipped workshop.
- 11.4 Availability of genuine spare parts.
- 11.5 Trained and skilled manpower.
- 11.6 Availability of all resources.
- 11.7 High response and communication skills.

