

TENDER DATA

Project title:	Appointment of service providers onto the panel of manufacturers, assemblers, and resellers of standby generators and standby generator control panels for the manufacturing, supplying, delivering, rigging, installation, commissioning, and SLA maintenance agreement for open sets, containerized, and canopy Standby Generators (STG) at various Sentech transmitter sites, on an “as and when” required basis for three (3) years
Bid no:	SENT/032/2025-26

1. BACKGROUND

Sentech is a state-owned company and the largest distributor of broadcasting signals in South Africa. Sentech is a licensed Electronic Communications Network Service provider in South Africa. It currently operates many telecommunication networks for Satellite, Television, Radio, Internet, and more. As such, Sentech is a global enabler of broadcasting and digital content delivery.

Sentech intends to appoint a panel of service providers for the manufacturing, supplying, delivering, rigging, installation, commissioning, and SLA maintenance agreement for open sets, containerized and canopy Standby Generators (STG), and control panels at various Sentech transmitter sites, on an “as and when” required basis for three (3) years with successful bidders. It is essential to note that Sentech does not promise a specific amount of work to any successful bidder.

The bid is divided into three sections, for which any bidder may offer a bid for one or a combination of the sections, or for all the sections. Suppose the bidder chooses to bid for more than one section. In that case, they should separate the evidence substantiating their claims under the mandatory and functional evaluation criteria for each section for which they are bidding. Bidders are required to indicate the section for which they are bidding.

SECTIONS

The sections are:

Table 1: Generator size categories

No	Description	Please tick (✓)
1	SECTION A = up to 100kVA (SMALL)	
2	SECTION B = above 100kVA but less than 350kVA (MEDIUM)	
3	SECTION C = 350kVA and more (LARGE)	

2. SUBMISSION OF BIDS and CLOSING

- 2.1 This Bid closes on the date and time stipulated on the Notice and Invitation to Bid (SBD1). Bids can be submitted electronically via the eTender Portal and/or by hand to the tender box at Sentech Offices, Octave Road, Radiokop Ext 3, Honeydew, Johannesburg.
- a) Bidders that opt to deposit their bid documents in the tender box must do so on or before the closing date and time, during working hours only (08:30-15:30). No late submissions will be accepted.

- b) Bidders who opt to submit via the Sentech eTender Portal ("the eTender Portal") are advised that the eTender Portal has a files size limit of 30MB. Bidders must upload their tender documents timeously. The eTender Portal is available 24hrs a day. No late submissions will be accepted.
- c) It is incumbent on the bidder to ensure that their bids are submitted timeously via the selected method before the closing date and time. Sentech will not take any responsibility of any incomplete submissions or late tenders, for any reason whatsoever.
- d) Telegraphic, telephonic, telex, facsimile, e-mail and late Bids will not be accepted.

2.2 This is a two-envelope system for Bid Evaluation. Bidders must submit their proposal and all supporting documentation in a sealed envelope, clearly marked as follows:

- a) For manual submissions, Envelope One must consist of "Original Technical Proposal together with a soft copy in PDF format of an electronic medium e.g. USB etc. The soft copy will consist of a single PDF document containing the complete response. The envelope must contain all information and documents relating to the Bid. (Refer to the list of returnable documents.)
- b) No Financial Information must be included in Envelope One.
- c) Envelope Two "Original Financial Proposal" (Contract Date and Pricing schedule/schedule of rates as applicable) together with 1 copy of "Financial Proposal" together with a soft copy in PDF format of an electronic medium e.g. Compact Disk (CD), USB etc. The soft copy will consist of a single PDF document containing the complete Financial Proposal.
- d) Bidders are required to place the sealed Envelope One together with the sealed Envelope Two into one sealed envelope or container. The sealed envelope or container must be marked with the following information:

For Attention:

- HEAD OF SUPPLY CHAIN MANAGEMENT
 - BID REFERENCE NO: SENT/032/2025-26
 - TECHNICAL AND FINANCIAL PROPOSALS
 - INSERT CLOSING DATE AND TIME
 - BIDDER'S NAME AND ADDRESS
- e) Bidders that combine their Technical Proposal with the Financial Proposal (or any financial information) will be automatically disqualified and not be evaluated further.
 - f) The financial proposal will only be opened and evaluated should the technical proposal be found to be responsive, being that the technical proposal has met the minimum technical evaluation criteria that are set out in the Bid Documents.
 - g) The Bidders shall insert a table of contents and bind (ring bind or similar method) the proposal documents and verify the page numbers, as Sentech will not accept any liability with regard to any disputes arising from pages that are missing or duplicated in the aforementioned documents.
 - h) Bidders are required to complete and sign all the returnable documentation (refer to the list of returnable documents) and initial all pages, drawings, and brochures which are included in the reply, as Sentech will not accept any liability with regard to any disputes arising from pages that are missing or duplicated in the aforementioned documents.
 - i) Late submissions will not be considered.
 - j) For online submissions via the e-Tender portal, submission requirements are directed by the system. Bidders must follow instructions in the Bidder's manual.

3. SIGN AND INITIAL

Bidders are required to complete and sign the Bid Forms where required and initial the bottom of all pages, drawings, and brochures which are included in the submission, as Sentech will not accept any

liability with regard to any disputes arising from pages that are missing or duplicated in the aforementioned documents.

Both original signatures and electronic signatures will be accepted.

4. COMPLETION OF BID DOCUMENTS

Bidders must ensure that they complete all sections of the Bid Documents as per the requirements in the Bid.

Bidders must use only the Bid documents provided by Sentech. Photocopying of the Bid document is permitted; however, Bidders must not retype or redraft the Bid documents.

5. BID VALIDITY

This Bid shall remain valid for a period of 90 days only. An extension of the Bid validity, if justified in exceptional circumstances, shall be requested in writing from all Bidders before the expiration of the 90-day period.

6. COSTS OF PREPARING THE BID SUBMISSION

Bidders shall bear all costs associated with the preparation and submission of the proposals. Sentech shall under no circumstances be held responsible or liable for any costs incurred during the bidding process.

7. ADMINISTRATIVE RESPONSIVENESS CRITERIA

Bidders are required to ensure that they meet all the Administrative Responsiveness Criteria.

8. BBBEE CODES AT SENTECH

Sentech complies with the codes of good practice as prescribed by the DTI, to advance Broad-Based Black Economic Empowerment.

9. SUBCONTRACTING AS A CONDITION OF BID

The successful Bidder must subcontract a minimum of _____% of the value of the contract to _____ (specify the designated group targeted).

10. TRANSFORMATION PLAN

A transformation plan is a record of activities an entity intends to undertake to improve its BBBEE Level through Ownership, Management and Control; Skills Development; Enterprise and Supplier Development and Socio-Economic Development.

Sentech reserves the right to request a BBBEE transformation plan with clearly defined timelines and milestones if the recommended Bidder does not meet Sentech's transformation goals. These milestones must be achieved over the term of the contract. This transformation plan must be submitted within 10 working days from the written request, failing which Sentech reserves the right to withdraw its appointment of the preferred recommended Bidder.

11. LOCAL PRODUCTION AND CONTENT

In the case of designated sectors, where in the award of Bids, local production and content is of critical importance, such Bids will contain a specific bidding condition that only locally produced goods, services, or works, or locally manufactured goods, with a stipulated minimum threshold for local production and content, will be considered.

Does this requirement fall under any designated sector as prescribed by the DTI?	Yes	No
If yes, specify the sector.		
Specify the minimum threshold applicably		

*Bidders must fill in the SBD6.2 for Local Content and Production

12. EVALUATION CRITERIA

The evaluation criteria are stipulated in 18 below. It is the Bidder's responsibility to ensure that it has responded to the evaluation criteria. Failure to meet the evaluation criteria will result in the Bidder not being evaluated further. Bidders must ensure that they have included all supporting documentation required to support their response to the Bid.

13. OBJECTIVE CRITERIA

- 13.1 Sentech reserves the right not to award this tender to any Bidder or any of its directors or subcontractors who during the preceding five (5) years –
 - 13.1.1 failed to perform satisfactorily on a previous project with Sentech or any other organ of state; or
 - 13.1.2 wilfully neglected, reneged on or failed to comply with any government, municipal or other public sector contract.
- 13.2. Sentech further reserves the right not to award this Tender to any Bidder or any of its directors or subcontractors who have been blacklisted by any organ of state or committed and/or charged in any court of law or similar tribunal or forum with any act of tax non-compliance, fraud, corruption and/or dishonesty of whatsoever nature.

14. AWARD OF BID/S

Sentech may appoint one or more suppliers, in whole or in part, or not appoint any supplier/s at all, and/or cancel the Bid in its entirety, at Sentech's sole and exclusive discretion, in order to satisfy various needs which may be identified, and to manage certain risks associated with the supply of goods or services specified in respect of the Bid.

15. ALTERNATIVE/SUBSTITUTE PRODUCTS

In the case of contracts and/or panels, Sentech shall be entitled to consider and accommodate product upgrades during the tenure of the contract and/or panel. Bidders are required to bring all such developments to the attention of Sentech for approval.

16. BRIEFING SESSION

Should there be a compulsory briefing session for this Bid, Bidders must ensure that they attend the briefing session and sign the attendance register, as non-attendance or failure to sign the attendance register will automatically disqualify a Bidder from submitting a proposal for this Bid.

All questions raised by Bidders post the briefing session will be consolidated and shared with all Bidders at least seven (7) calendar days prior to closing.

17. CLARIFICATION

Enquiries related to Bid documents may be addressed to the Bid Administrator and Supply Chain Official as stated in SBD 1 Notice and Invitation to Bid.

18. BID EVALUATION METHOD

This Bid will be evaluated as described in the table below.

An 80/20 System will be followed for the Technical and Price offer	1. Stage 1 – Administrative Responsiveness Evaluation All technical proposals will be evaluated against the administrative responsiveness requirements as set out in the list of returnable documents. Sentech reserves the right to request clarification on any aspect of the tender in line with its policies. 2. Stage 2 –Technical Evaluation <u>Mandatory Evaluation Criteria</u> All Proposals that qualify based on the administrative responsiveness requirements will be evaluated against the Mandatory Evaluation Criteria. Bidders must COMPLY WITH ALL the Mandatory Evaluation Criteria to be eligible for further evaluation. Sentech reserves the right to request clarification on any aspect of the tender in line with its policies. <u>Functional Evaluation Criteria</u> Bidders qualifying in the Mandatory criteria will be evaluated against the Functional Criteria. Bidders must score 40 points or more out of a total of 65 points allocated. Bidders who score less than 40 points will not be evaluated further. Bidders who obtain 50 points or more will qualify for further evaluation. 3. Stage 3 – Risk Assessment Bidders who have qualified based on achieving the required evaluation score may undergo a further risk assessment and may be disqualified from further evaluation should the risk assessment warrant it or if there are compelling and justifiable reasons to disqualify a bidder. The risk assessment will be based on any identified risks arising from the bidder's responses and any other dangers that Sentech may identify.
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19. ADMINISTRATIVE RESPONSIVENESS REQUIREMENTS

To be administratively responsive, Bidders must ensure that they meet all the below mentioned criteria. Bidders that do not meet all the below mentioned criteria may not qualify to be awarded the Bid. Sentech reserves its rights in respect of the below criteria.

- Complete and return all documentation stipulated in the LIST OF RETURNABLE DOCUMENTS.

- All correspondence must be in English.
- Bidders must fill in all sections of this document (where applicable).
- **BLACK INK** must be used when completing the Bid documents.
- Bidders must use only the Bid documents provided by Sentech. Photocopying of the Bid document is permitted however Bidders must not retype or redraft the Bid documents.
- All corrections must be initialled. The use of corrective fluid is strictly prohibited.
- Bidders are required to fill in and sign the Bid Forms and initial all pages, drawings and brochures which are included in the reply as Sentech will not accept any liability with regard to any disputes arising from pages that are missing or duplicated in the aforementioned documents.
- Bidders must complete an attendance register at each compulsory site meeting attended.
- Appointment of a Bidder will be subject to signing, declaration and submission of SBD 1, 3.1, 3.2, 3.3, 4, 5, 6, 1, 6.2 8, and 9 depending on applicability.
- Complete and sign the Contract Data.
- Should this be a 2 envelope or 2 stage system, Bidders **MUST** separate the technical proposal from their financial proposal. The technical and financial proposals must be placed in two separate sealed envelopes.

20. AUTOMATIC DISQUALIFICATION

Sentech reserves the right to automatically disqualify Bidders from being awarded this Bid. The following will lead to automatic disqualification:

- Failure to submit a financial proposal, if required.
- The Bidder is or has been involved in any act of corruption or fraud or bribery or collusion or attempt to influence any employee of Sentech to award this Bid or any other Bid to it.

21. TECHNICAL RESPONSIVENESS COMPLIANCE

The Technical Evaluation will encompass evaluation of:

- Mandatory Criteria
- Functional / Technical Criteria

22. TECHNICAL EVALUATION CRITERIA

22.1 Mandatory Eligibility Criteria

The following criteria are mandatory for ALL BIDDERS:

Table 2: Mandatory criteria

Mandatory Eligibility Criteria	Attach evidence	Provide the reference page number in your proposal
The company must have a CIDB grading certificate of 2 EP or Higher	Valid proof of registration or CRS number	
Valid Letter of Good Standing with the Department of employment & labour's Compensation Commissioner - Compensation for Occupational Injuries and Diseases Act 130 of 1993 (COIDA), Federated Employers Mutual (FEM), or Rand Mutual Assurance (RMA)	Valid letter of Good Standing from DOEL's CF, FEM, or RMA (the nature of the Business should be in alignment with the SOW)	
OCM accreditation for the Engine	Valid OCM letter or certificate, or a maximum of 3 tiers of back-to-back support agreement (i.e., only tier 1, 2, and 3 agreements are acceptable) Note: See Notes 2 and 3 below	
OCM accreditation for Alternator	Valid OCM letter or certificate, or a maximum of 3 tiers of back-to-back support agreement (i.e., only tier 1, 2, and 3 agreements are acceptable) Note: See Notes 2 and 3 below	
OCM accreditation for the dedicated generator controller	Valid OCM letter or certificate, or a maximum of 3 tiers of back-to-back support agreement for DSE controllers (i.e., only tier 1, 2, and 3 agreements are acceptable) Note: See Notes 2 and 3 below	
Staff qualified and competent in the application of their skills that relate to the scope of the project (installation electrician)	Detailed CV of the installation electrician Clear copy of a valid installation or master electrician card issued by the Department of Employment and Labour.	
Staff qualified and competent in the application of their skills that relate to the scope of the project (diesel mechanic)	Detailed CV of a diesel mechanic Clear copy of a valid trade certificate from QCTO (Quality Council for Trades and Occupations) or equivalent.	

NOTE 1: Bidders that do not comply with all the above criteria will not be evaluated further.

NOTE 2: Definition of OCM (Original Component Manufacturer) and Supply Chain Tiers

- a. **OCM (Original Component Manufacturer):** Refers specifically to the manufacturers of the **engine, alternator, or controller** used in the diesel generator.
- b. **Three Supply Chain Tiers are recognized:**
 - **OCM:** Original component manufacturer (OCM) sits at the top of a supply chain tier system
 - **Tier 1:** Engine / Alternator / Controller distributor/Importer
 - **Tier 2:** Diesel Generator Manufacturer (uses components from the distributor/importer in generator assembly)
 - **Tier 3:** Reseller (procures completed generator sets from the manufacturer (Tier 2) for onward sale)
- c. **Distributor/Importer requirement (Tier 1):**
 - A **distributor/importer** must hold a valid back-to-back support agreement with the **OCM**.
- d. **Manufacturer requirement (Tier 2):**
 - The Diesel Generator Manufacturer (Tier 2) must provide letters of authorization from Tier 1 (i.e., Distributor) and the relevant OCM (showing the relationship between Tier 1 and the OCM).
 - Both authorization letters must be submitted with the tender as proof of valid OCM backing.
- e. **Reseller Requirement (Tier 3):**
 - A **reseller** must hold a valid back-to-back support agreement with the Diesel Generator **Manufacturer** (Tier 2).
 - The Diesel Generator **Manufacturer** (Tier 2) must, in turn, provide letters of authorization from Tier 1 and the relevant **OCM** (showing the relationship between Tier 1 and the OCM).
 - All three authorization letters must be submitted with the tender as proof of valid OCM backing.
- f. **Acceptable Support Arrangements**
 - Only **Tier 1, Tier 2, and Tier 3 arrangements are acceptable**.
 - Any arrangements beyond Tier 3, or without the required OCM authorization letter, will be deemed **non-compliant**.
 - Please take note that the required authorization letters are required for all the components (i.e., DSE controller, engine and alternator)

NOTE 3: Definition of Tiers and Authorization Requirements

- **Tier 1: Mainly a distributor/importer**
 - Directly appointed and formally authorized by the OCM.
 - Holds official agreements with the OCM.
 - Fully authorized to deliver, install, and provide technical support for OCM products and solutions.
- **Tier 2: Mainly an assembler**
 - Appointed through a Tier 1 (indirect authorization).
 - Operates under the supervision or partnership of a Tier 1.
 - May deliver or install products but has no direct agreement with the OCM.
- **Tier 3: Mainly a reseller**
 - Appointed through a Tier 2 (further removed from direct OCM authorization).
 - Operates under the supervision or partnership of a Tier 2.
 - May deliver or install products but has no direct agreement with the OCM.

22.2 Functional Criteria

Note: This criterion will be evaluated for each section (i.e., Section A, B, and/or C) as elected by the bidder. Evidence provided for a higher section will be accepted for a lower section (Evidence used for Section C will qualify a bidder for Section A and B, but not vice versa)

Table 3: Functional Criteria

Functionality criteria	Proof Required	Points
1. Overall experience- number of years in the manufacturing/assembly and supplying of Open sets, Containerized, or Canopy Standby Generators. (Company) <i>Number of years of experience</i> ○ Less than 1 year.....0 ○ 1 - 3 years.....10 ○ More than 3 - 9 years.....15 ○ More than 9 years.....20	• Provide a company profile highlighting the years of experience (company) in similar work as per the scope	20

2. Overall experience of a programmer in programming and installing DSE controllers. (Programmer) <i>Number of years of experience</i> ○ Less than 1 year or no certificate.....0 ○ 1-3 years.....5 ○ More than 3 - 9 years.....10 ○ More than 9 years.....15	Detailed relevant CVs. If you are a reseller/assembler, please ensure that your identified partner provides the CVs of their staff Clear copy of a certificate related to DSE controller programming	15
3. Track record: The company must supply references for similar projects as the section tendered for, e.g., Section A, B, or C. Points will be allocated based on the number of relevant references supplied. ○ 0 reference.....0 ○ 1 reference.....10 ○ 2 references.....15 ○ 3 references.....20 ○ 4 references.....25 ○ 5 references.....30	- Completed Company reference table: (Table 5). - Signed reference letters, a completion certificate, or an affidavit <i>Note: If using a partner, please provide the references from the partner.</i>	30
Total Points:	65	

Table 3: Functional Criteria

The total minimum qualifying functional score is **40** points.

23. Risk assessment

All bids that pass the technical evaluation in 22.1 will undergo a risk assessment based on the following framework:

Criteria	Comments
e.g., Dishonesty in information presented	
Any additional information received from past references	
Financial and operational sustainability of the Bidder	
Any other information that Sentech may deem important	

NB: Sentech may disqualify Bidders based on the outcome of the risk assessment.

24. Evaluation of Price and Preference

This Bid will be evaluated on a points system based on weighted average score for Price and Preference as per Preferential Procurement Framework Act of 2000 (Act 5 of 2000). Accordingly, either the 80/20 or 90/10 preference point system will apply, and the highest acceptable Bid will be used to determine the applicable preference point system.

25. Preference Point allocation – 80/20 or 90/10

Price / Preference	Weighting (80/20)	Weighting (90/10)
Preference:	20	10
Price:	80	90
Total must equal:	100	100

Sentech will award preference points according to the following table:

Goal	Points (80/20)	Points (90/10)	Evidence required
Historically disadvantaged by unfair discrimination based on Race	10	5	A valid BBBEE Certificate showing at least 51% black ownership
	5	3	A valid BBBEE Certificate showing at least 25.1 – 50% black ownership
	3	2	An owned company showing at least 5 – 25% black ownership
	0	0	Below 5%
Historically disadvantaged by unfair discrimination based on Gender (women)	8	4	A valid BBBEE Certificate showing at least 51% women ownership
	4	2	A valid BBBEE Certificate showing at least 25.1 – 50% women ownership
	2	1	A valid BBBEE Certificate showing at least 5-25% women ownership
	0	0	A valid BBBEE Certificate showing at least 5% women ownership
Historically disadvantaged by unfair discrimination based on disability	2	1	A doctor's note confirming disability or confirmation of disability from the Department of Labor (EEA1 form) or equivalent
Total Points	20	10	

26. Price Calculation 80/20

The following formula will be used to calculate the points for price.

$$P_s = 80 \left[\frac{1 - (P_t - P_{min})}{P_{min}} \right]$$

Where:

P_s = Points scored for the price of bid under consideration
 P_t = Rand value of bid under consideration

Pmin = Rand value of lowest acceptable bid

27. Price Calculation 90/10

The following formula will be used to calculate the points for price.

$$Ps = 90 \left[\frac{1 - (Pt - Pmin)}{Pmin} \right]$$

Where:

Ps = Points scored for the price of bid under consideration

Pt = Rand value of bid under consideration

Pmin = Rand value of lowest acceptable bid

THE SCOPE, OBJECTIVES, AND EXPECTED OUTPUTS

TECHNICAL SPECIFICATION REFERENCE ONLY

1. Background

This specification covers the requirements for a self-contained, automatic-starting diesel Standby Generator set, which shall operate as a standby backup power source. A weatherproof canopy with soundproofing shall be provided if called for.

The system, as described in this document, will be used to power a remote transmitting station. A highly reliable and stable electrical supply must be generated under varying load conditions without increasing the ambient noise level above acceptable limits.

2. System Description

The system shall consist of a diesel-driven generator set mounted on a duplex base frame, capable of delivering the power rating specified for each Sentech station or as listed in the schedule of information, as requested by Sentech.

The generating set shall be housed within an engine room or a container/canopy on site, as specified by Sentech.

The control panel shall be housed within the specified engine room, as described above. An oil makeup tank and auxiliary filler equalizer tank with a ball valve should be housed in the engine room or container/canopy. All other requirements are detailed elsewhere in this specification.

3. Extent of Work

The extent of work covered by this specification includes the design, manufacture, testing, and delivery of a complete operating system as specified.

In addition, a 12-month warranty must be provided.

A three-hour full-load factory witness test (fuel for this to be provided by the tenderer). Additionally, the provision of all handbooks, workshop manuals, drawings, and circuit diagrams is included.

4. Cooling System

The control equipment shall be cooled by radiation and convection only; no cooling fans are acceptable.

All equipment shall be capable of continuous operation within its specified performance at transmitting sites having the worst physically compatible combination of the following environmental factors:

- Altitude: 2000 meters above sea level
- Temperature: worst possible minimum room ambient - 5°C

Normally: expected minimum room ambient + 10°C

Worst: possible maximum room ambient + 45°C

Normally expected maximum room ambient + 30°C

- Relative humidity: between 20% and 90% RH

5. Exhaust System

The exhaust system shall be designed in accordance with recommendations from diesel manufacturers to minimize excessive back pressure under full and overload conditions.

Flexible connections of the bellows type shall be used between the engine exhaust manifold and exhaust pipe.

Flanged bolt-on type connections with suitable gaskets shall be used on the entire exhaust system.

The Exhaust Silencer is to be Stainless steel clad.

6. Oil-Make-up Tank

The lubricating oil system in the engine sump shall contain enough oil to allow 24 hours of continuous operation at full load without needing replenishment. An oil-makeup tank shall be supplied to allow for prolonged, continuous operation.

7. Miscellaneous Requirements

A drip tray large enough to catch drops from anywhere on the engine or cooling system, and at least 25mm deep, shall be provided and installed to allow easy removal.

All wiring shall be carried out in PVC-insulated conductors of adequate size, and no joints shall be allowed.

An approved trap filter assembly (**Duvalco Mk 4 DSF – 6.5L / min.**) or (**Duvalco Mk 3 – 4.5 L / min.**) or equivalent with a minimum useful life of 200 hours shall be fitted in the engine fuel lines.

A synchronous electrical hour control counter shall be connected to the engine output to indicate actual engine hours.

The engine shall be fitted with heavy-duty air, fuel, and oil filter cartridges with a minimum useful life of 200 hours.

The tenderer shall supply the specific fuel consumption of the set with auxiliary equipment in 1/hour at full and half load.

The completed diesel alternator set shall comply with the Occupational Health and Safety Act 85 of 1993 as amended.

Approval of working drawings is to be obtained before any assembly can begin.

8. Earthing

All metal parts shall be solidly bonded and electrically connected to a common earth point. The neutral of the system shall be solidly connected to this point.

In the case of a Cambus 2 engine control system, Surge arrestors need to be fitted on communication line 1 at the ECU and line 1 at the controller.

9. Labeling

All controls, meters, and switches shall be labeled in English.

Wires shall be clearly marked at all termination points in accordance with the numbering of the manufacturer's diagram.

Engine

A multi-cylinder diesel engine running at 1500 rpm and rated for continuous duty in accordance with B.S. 5514 shall be provided. A water-cooled engine is preferred.

The engine shall be fine-tuned to a tolerance of plus/minus 5 rpm for all loads.

Transient speed variations when the load changes by 50% shall not exceed 50 rpm, and recovery shall be within 5 seconds.

All ratings shall be for 2000 meters altitude, 40°C, and a relative humidity of between 20% and 90%.

NOTE: ENGINE TO BE ABLE TO DELIVER MAXIMUM ALTERNATOR OUTPUT – CONTINUOUSLY AT UNITY POWER FACTOR (PF 1) ON SITE.

The engine shall be equipped with the following facilities:

- Cooling Radiator if a water-cooled engine is offered.
- Engine starter motor.
- Automatic Radiator Louver arranged to close when engine is stationary – ONLY in some instances when required.
- Cold starting equipment – engine heater system
- Fuel pump solenoid arranged to be energized to run.
- Fuel lift pump.
- Fuel filters.
- By-pass type lubricating oil filter.
- Lubricating oil level dipstick.
- Easy facilities for draining lubricating oil sump.
- Dry-type replaceable cartridge air filter.
- Engine-driven battery charging alternator.

- Low oil pressure switch arranged to shut down plant on low oil pressure.
- Low coolant level switch arranged to shut down the plant on low coolant level.
- Electrical sensors for remote indication of oil pressure and water temperature.
- Fixed overload stop set at 10%.
- High engine temperature switch fixed in a suitable position on the engine and arranged to shut down the plant on high engine temperature.
- Over-speed shutdown device to protect against runaway.
- Instrument panel containing engine hour meter, oil pressure and water temperature gauge, H.E.T., and L.O.P. test buttons mounted conveniently on the Generator Base Frame.

The lubricating oil system in the engine sump shall contain enough oil to allow 24 hours of continuous operation at full load without needing replenishment.

Should an oil make-up tank be supplied to meet the above requirements, it shall comply with the following:

- An equalizing device shall be fitted to maintain the sump oil level constant – **Murphy-type oil device recommended.** (Or Equal Approved)
- An isolating valve shall be fitted between the tank and engine sump.
- The filler cap shall be such that the tank may be easily filled, but once closed, no spillage can occur in transit.

10. Battery

A 12V/24V fully charged heavy-duty Delco type 1250 (high cycle) maintenance-free **battery** (Or Equal Approved), rated for the voltage and current requirements of the starting motor(s) and control equipment shall be supplied. The battery discharge capacity at 0°C shall be such that the full cranking current may be drawn for three (3) successive engine start attempts, each lasting 10 seconds with 10-second rest periods, without the voltage falling below 1.3 volts per cell.

The battery shall be maintained in a fully charged state by an engine-driven battery charging alternator with automatic charge rate control.

The battery shall stand in an acid spillage tray treated with acid-resistant paint, positioned so that adequate ventilation is provided.

Adequate natural ventilation shall be provided between and around the batteries.

The battery shall be date-stamped with the year and month of manufacturing.

11. Alternator

The alternator shall be of the two-bearing type coupled to the engine through a suitable flexible coupling. It shall be of the brushless, self-excited, screen-protected, drip-proof type, and shall comply with the following conditions:

Output Voltage	400 / 231 Volts
Voltage Waveform	Sinusoidal

Max acceptable wave-form distortion	5%
Power factor	Between 0 and 8 lagging to unity
Phases and Wires	3-phase 4-wire
Frequency	50 Hz
Insulation class	H
Speed	1500 rpm
Overload rating and 300% for 10 Seconds	10% for 1 hour
Max. & Min. operating temperatures	+45°C and -5°C
Voltage regulation	Plus/minus 3% from 0 to 100% load at any power factor between 0.8 lag and unity, inclusive of speed variation of 4.5%
Transient recovery	To within 3% of the steady State value in less than 1 second upon application of full load at 0.8 lagging
Steady state voltage	0, 5% of rated voltage
Max. Voltage dip on application of the Load	<20% of rated full load voltage

Radio and TV interference suppression shall comply with local legislation.

12. Control Panel

The control panel shall be managed by a dedicated generator controller from Deep Sea Electronics, suitable for a 12 Volt/24 Volt DC Power supply, with sufficient inputs and outputs for controlling a standby diesel generator plant, including all the related indications and alarms specified. It must have a front panel graphic user interface, and it must be remotely configurable(via IP network) with separate access levels(operator, programmer)

The Control Panel needs to have the facility to be remotely accessed. This must be via a Network.

All Control Circuits are to be protected with Circuit Breakers.

The control panel shall be fitted with a suitable Circuit Breaker sized to the set output, and in some instances, change-over equipment is required. Note: - NS 100 frame size – with electronic trip to suit application – no Isolators to be used.

The control panel shall be supplied, and due consideration shall be given to protecting it from moisture ingress. Adequate working space shall be provided in front of the panel, and it shall be complete with the following instruments and facilities:

- Stop/start buttons where applicable.
- Frequency meter, Read or digital read-out type in the range 47 to 53Hz, with an accuracy consistent with frequency stability being achieved
- "Alternator output available" LED indicating lamps
- "Mains available" LED indicating lamps
- Auto/manual/test selector switch

- Over speed alarm indication
- Engine temperature high alarm indication
- Engine oil pressure low alarm indication
- Engine low coolant indication (Warning) (To indicate that the coolant needs to be topped up)
- Second Low coolant sensor (Shutdown) (To indicate that the coolant is too low for the Engine to operate without harm)
- Mains contactor or Motorized breaker failure
- Alternator overload alarm indication
- Start failure alarm indication
- Abnormal voltage alarm indication
- Faulty switch position indication
- Battery charger Warning alarm indication

It should be noted that the operation of any alarm condition should cause the engine to stop.

Should the engine stop due to the operation of any of the protection circuits, a light shall indicate why the engine has stopped. This indication shall remain on until canceled, and no secondary light shall come on, which could confuse fault diagnoses.

13. System Operation

The power supply control unit is required to:

- Monitor the mains supply continuously
- Disconnect the load in the event of a mains failure or Mains Dip
- **Mains contactor or Motorized breaker monitoring.**
- Start the diesel-driven power-generating set and connect to the load as soon as the alternator output voltage is within specification
- Provide the necessary protection to the generating equipment and load equipment while the standby generator is in operation
- Reconnect the load to the standard mains supply when the mains fault has been cleared
- Provide a single switch to facilitate bypass to mains direct or alternator direct (part of Controller), with a Visible Standard operating Procedure
- The system shall operate in a Fail-Safe Mode (In the event of a Controller Failure)
- Mains failure counter
- Hour meter- Engine Operating Hours

The abovementioned functions shall be performed in the following sequence:

- When the main contactor opens, the start command to the diesel engine shall be delayed for 6 seconds after the detection of an "out of specification" mains condition.
- Should the mains "out of specification" condition cause the mains contactor to drop out, then the engine shall be forced to run and accept the station load.

- Should the Mains contactor fail under normal conditions, the STG needs to be started (with a 50-second Delay), take the load, and indicate.
- Three start attempts of 10-second duration with ten-second intervals between attempts are required.
- The starter motor shall be disengaged immediately after the engine has started, and engine protection devices shall be activated ten seconds later to allow for oil pressure to reach working pressure.
- The alternator contactor shall be closed six seconds after the alternator output has reached the correct voltage and frequency.
- In the event of a start failure or any alarm condition causing failure of the standby plant, the mains shall be reconnected to the load.
- When the mains supply is reinstated, the standby generator shall continue to operate on load for a further fifteen to thirty minutes. Any further mains faults registered during this load rundown period shall reset the timing sequence and keep the standby plant on load until the mains has stabilized.
- Two 6-second delays are required when changing back from the standby power to mains, i.e., between the opening of the alternator contactor and the closing of the mains contactor.
- A five (5) minute no-load rundown time shall be required for cooling of the diesel engine.
- In the event of the mains failure during the no-load rundown period, the same delay of six seconds as specified in 14.2.8 shall be introduced between mains contactor opening and alternator contactor closing.
- On a mains failure, within ten seconds after the rundown period has lapsed, the system shall ensure that a start command shall not be given whilst the diesel engine may still be rotating.
- In the event of the mains contactor opening, re-closure of the same shall be delayed for 6 seconds irrespective of the reason for opening.

Two voltage monitoring facilities shall be provided, one each for mains and alternator, and shall comply with the following requirements:

- The voltage/phase sensing circuitry shall be physically isolated from the rest of the control circuitry to limit possible lightning damage to one area only.
- Voltage sensing between phases and phases and neutral.
- Over-voltage drop-out shall be adjustable between 110% and 120% of the standard supply voltage (230V) and adjusted to 115%.
- Under-voltage drop-out shall be adjustable between 80% and 90% of normal supply voltage (230V) and set at 85%.
- The monitors shall be of the eleven-pin circular plug type and shall be Electrometric or equivalent.
- The alternator shall be provided with a frequency monitor, set to limits of plus/minus 10% to 50Hz.

The following timing functions are required:

- Mains contactor opening on detection of a voltage or phase fault – 1, 5 / 3, 0 seconds.
- Mains contactor closing - Two (6) seconds.
- Start command - Initiated by mains contactor opening – six (6) seconds

- Start attempts - Three of ten seconds duration with ten-second intervals between attempts.
- Alternator contactor closing - Six seconds after output has reached voltage and frequency specification.
- Alternator to mains changes-over - Adjustable from 10 to 60 minutes after restoration of mains supply.
- Alternator to mains contactor delay - A six-second delay is required between alternator contactor opening and mains contactor closing.
- No-load rundown time - Five minutes.
- Mains to alternator contactor delay - A six-second delay is required between mains contactor opening and alternator contactor closing when a mains failure occurs during the rundown period.
- Engine protection bypass (for oil pressure) - A ten-second delay is required after the diesel has started.
- Override facility - This facility shall be provided to switch back to the mains, should the alternator fail to take load after a mains failure, bearing in mind the 6-second delay required as stipulated above.

A parallel protection circuit with individual indications shall be provided for the following functions:

- Engine oil
- Engine temperature

The following alarm outlets shall be provided for remote indication via a dedicated generator controller and a Remote Monitoring Unit. (Deep Sea 892). It must be SNMP-enabled for remote connectivity to Sentech's NMS system.

- Mains out of specifications
- Diesel Engine running
- Alternator on load
- Mains on load
- Urgent alarm
- Common/deferred alarm

Above alarm outlets shall consist of one voltage-free change-over contact and shall be locked till the condition has been reset.

One mains-operated battery charger, complete with an ammeter, voltmeter, and protection, shall simultaneously charge the engine starter battery and the control battery (if provided), the latter via isolating and limiting circuitry.

The Battery charger shall operate in parallel with the engine-driven generator. It shall have self-adjusting, stepless control characteristics (constant voltage, current limiting) to prevent excessive water loss under float conditions.

A loss-of-charge current alarm shall be provided to indicate failure of the mains charger. This may be a current or voltage monitor. The alarm signal (via contacts or voltage) shall be connected to the terminals for connection to an external monitoring system.

An earth bar to which the metal parts of all individual units and sub-units are connected shall be provided in the equipment racks. The neutral point of the system shall be solidly attached to the bar. Suitable terminal halls will be provided on the earth bar for connection of the central earth conductor.

Suitable surge suppression devices shall be included in the design to combat line voltage surges resulting from cloud-induced charges and lightning. Surge suppression devices shall be **Dehnventil / Dehnguard/ Blitzductor type or equivalent.**

Equipment racks shall be of the free-standing, floor-mounted type of folded sheet steel construction having a minimum thickness of 2mm.

Bottom or top cable entry with gland plates shall be provided.

Adequate vermin-proof ventilation openings shall be provided at the bottom and top parts of the cabinets.

Painting of equipment racks shall be done as follows:

- The interior of all equipment racks shall be painted with two coats of best quality "Enamel" paint, and the outside shall be painted with two coats of approved color paint.
- All metal parts to be degreased, rinsed, pickled, rinsed, phosphate, neutralized, and then thoroughly dried. This process shall be followed up within 48 hours by application of one layer of high-quality zinc chromate primer of minimum thickness 0,04mm.
- The abovementioned primer to be followed by two coats of a good quality alkyd-based baked enamel. The minimum film thickness of the paint after baking shall not be less than 0,06mm.

The colors of the panel shall be as follows:

- All the frames to be **Electric Orange, code B26 SABS 1091-1975.**
- All doors and removable panels shall be **Red, code CA11 SABC 1091-1975.**

The control equipment shall be cooled by radiation and convection only, and no cooling fans shall be acceptable. All equipment shall be capable of continuous operation with its specified performance at transmitting sites having the worst physically compatible combination of the following environmental factors:

Altitude	- 2000 meters above sea level
Temperature	- <u>Worst</u> possible minimum room ambient -5°C
	- <u>Normally</u> expected minimum room ambient 10 °C
	- <u>Worst</u> possible maximum room ambient 45°C
	- <u>Normally</u> expected maximum room ambient 30°C
Relative humidity	- Between 20% and 90% R.R.

14. Spare Parts and Component List for Control Panels

Every handbook supplied shall contain a comprehensive parts list of spare parts considered necessary for the proper operation and maintenance of the plant.

A first spare set of Filters and V-belts to be supplied with the Generator set

15. Drawings and Handbooks

- Three complete handbooks, drawings, circuit diagrams, and workshop manuals for the engine and alternator in the English language shall be supplied.
- Tenderers are to note that until all of the abovementioned quantities of these handbooks have been delivered to Sentech, delivery will be deemed to be incomplete even though the equipment may have been delivered and put into scheduled service.
- The contractor shall provide Sentech with one transparency of each approved arrangement and the final detailed working drawing of all plant.
- All drawings to be supplied by the contractor in terms of this clause shall be used by Sentech for its own purposes only. Sentech shall not knowingly allow the said drawings to be used by others for purposes contrary to those stated above. The undertaking shall also apply to drawings made by approved subcontractors.

16. Commissioning and Test Facilities

- Tests shall form part of the contract, and the contractor is to provide test facilities, instruments, and dummy loads, including reactive elements and contactors, to suit the alternator capacity. Tenderers to specify where the test facilities are available.
- The terminal voltage across each battery is to be checked. The density of the electrolyte in each cell of the lead-acid starter batteries is to be checked.
- The system operation and fault protection circuits have to be tested to the satisfaction of Sentech.
- Comprehensive commissioning tests shall be carried out at the contractor's premises.
- The contractor shall be responsible for the provision of all the necessary fuel and equipment to carry out the above tests.
- The diesel-alternator set is to undergo a 3-hour load test at the supplier's premises or as mutually agreed under the supervision of Sentech. The set shall undergo a whole load test for 2 hours, followed by a 10% overload for one hour. The load shall include reactive elements for a power factor of 0.81 (Unity)
- All the following readings have to be taken at 15-minute intervals :
 - Engine temperature
 - Oil pressure
 - Oil temperature
 - Frequency
 - Alternator voltage and load
 - Alternator current
 - Power factor (alternatively, wattage)
 - Ambient temperature

At the end of the test, the alternator's temperature should be checked, and the fuel consumption should be determined.

17. DELIVERY

The completed and tested unit shall be delivered to Sentech's premises as specified by Sentech.

Approval of working drawings is to be obtained before any assembly can take place.

The contractor shall provide Sentech with working drawings, Maintenance and Operating manuals, as well as any other documents/drawings which are called for in the Technical Specification or documentation forming part of this contract or as agreed upon.

Every handbook supplied shall contain a comprehensive parts list considered necessary for the proper operation and maintenance of the plant.

A detailed program of the design and manufacturing periods, following the award of the contract, shall be submitted.

NB:Spare set of Filters, Belts, and dedicated generator (utilized in the control panel), Controller (to be supplied with every Control Panel / Generator set

Pricing Schedule (not for evaluation purposes)

In the case of equipment suppliers from outside the Republic of South Africa, prices must be quoted in the currency of the country of origin. Prices must be based on a delivered, duty-paid cost (including VAT, ad valorem, insurance, etc.) for delivery to Sentech in Honeydew, Gauteng, South Africa. Sentech will apply the prevailing exchange rate to convert the price to Rand at the time of evaluation, standardizing all price offers for comparison.

Table 4: Pricing Schedule

Unit Price (Model and description)			
A	500kVA Standby Generator (as described in the Part C3: Scope of Work)	Inclusive Unit price (applicable currency)	
		Installation and Commissioning rate	
		Lead time (days)	
B	250kVA Standby Generator (as described in the Part C3: Scope of Work)	Inclusive Unit price (applicable currency)	
		Installation and Commissioning rate	
		Lead time (days)	
C	100kVA Standby Generator (as described in the Part C3: Scope of Work)	Inclusive Unit price (applicable currency)	
		Installation and Commissioning rate	
		Lead time (days)	
Traveling rate/km (Services and maintenance)			
Travel Airfare (percentage on real cost)			

Accommodation and Subsistence costs will be agreed upon in line with the LATEST Tariffs /Rates as set out by the Department of Public Service and Administration. (www.dpsa.gov.za)

28. Declaration of Authority

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this Bid Data is understood and all requirements will be adhered to.

Name of Bidder	Signature	Date	Designation

TABLE 5: REFERENCES

Please complete the customer reference table and relevant Contact telephone number and attach reference letters.

Customer		Service Provided	Contact Person	Contact tel. no.	Contractual commencement date	Contractual completion date
1						
2						
3						
4						
5						

6						
7						
8						
9						
10						

Name of Tenderer	Signature	Date