Invitation to Bid

The NRF invites you to bid for the requirements listed in this document

BID NUMBER
NRF/CORP ICT 007/2018

Closing Date and Time
8 FEBRUARY 2019 AT 11:00

BID DESCRIPTION

INSTALLATION OF ELECTRICAL AND REDUNDANT POWER WITH CONCRETE FOOTINGS WITH MAINTENANCE AFTER INSTALLATION FOR SIX YEARS FOR THE NEW DATA CENTRE FACILITY AT THE NRF CORPORATE OFFICE IN PRETORIA
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## INVITATION TO BID (SBD 1)

<table>
<thead>
<tr>
<th>Bid Number</th>
<th>NRF/CORP ICT 007/2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closing date and time</td>
<td>8 February 2019 at 11:00</td>
</tr>
</tbody>
</table>

The NRF recognises the date and time as recorded on its systems for closure purposes.

### HIGH LEVEL SUMMARY OF BID REQUIREMENTS

Supply, install, and maintain a new backup power supply for the datacentre at the NRF consisting of 2 x 40 kVA (prime) generators in redundant configuration with 2 x 40 kVA UPS installation with 18 kwh batteries each in redundant configuration. The contract inclusive of maintenance of both elements is for six years.

The overview of the installation component of the bid requirements are:

- a. Connection from mains power (Main DB located in building basement)
- b. All cabling and wiring from the mains power supply to the new data centre
- c. New generator and redundant generator
- d. Generator controllers in a master/slave configuration, with GSM connection
- e. Automatic change-over for the generator/main supply – to be installed at new data centre
- f. All cabling, trenching, and containment for the generator supply
- g. Modbus cabling to existing BMS system (integration by others)
- h. Two UPS units in parallel, supplied from new generator/mains change-over
- i. Two battery charging units and batteries – one for each UPS – batteries to be a minimum of 18kW.h each.
- j. Distribution board for new data centre to distribute power from generator/mains change-over to UPS units. Distribution board to have generator section and two UPS sections (separate, to be fed from the new UPSs)
- k. Wiring and connection of existing network switch sockets to new UPS-fed distribution board (10 sockets outlets).
- l. The scope of works for the generator includes
  1. Trenching, sleeves, electrical and electronic reticulation
  2. The generators are to consist of 2 x 40 kVA, 0.8 power factor, continuous rated (45 kVA, 0.8 power factor standby rating), diesel generators, complete with a redundant generator of equal size. The generators are in a master-slave configuration. The generator installation will be connected to an existing Building Management System (BMS). The generator controller will be incorporated into the BMS. The modbus cabling required forms part of this contract. The integration of the generator into the BMS will be completed by the BMS installer/maintenance contractor and falls outside the scope of this contract.
  3. The generator installation shall be outfitted with a GSM module (with a 6 year SMS contract) and will alert the NRF of events including main power down, generator start failure, low diesel, maintenance required. The GSM shall also be able to accept and report on diagnostic requests.
- m. Generator plinths
  1. The contractor shall supply all the material required for and shall cast the plinth for the generator
set plinth. Minor earthworks to provide a flat area for the plinth is also required.

n. The specification to cover the complete installation of the Uninterrupted Power Supply (UPS) for the NRF new data centre.

EXEMPTION FROM THE CONSTRUCTION INDUSTRY DEVELOPMENT REGULATIONS (UPDATED JULY 2013 EFFECTIVE 1 AUGUST 2013):

The Construction Industry Development Board Act of 2000 (Act 38 of 2000) regulates the provision of construction works to the public sector within the construction industry. The Act and the National Treasury Instruction Note on Infrastructure Procurement and Delivery Management defines infrastructure/construction works as immovable assets acquired, constructed or which result from construction activities or movable assets that cannot function independently from purpose built immovable buildings.

In terms of CIDB’s Construction Industry Development Regulations Section 4, service provider undertaking the construction contract substantially consisting of the provision of labour or provision of supplies i.e. supply and installation of a power generator are exempt from CIDB Regulations.

This bid is under the above exemption, as the project substantially is the provision of supplies and the provision of labour to do the installation as well as the maintenance.

As this bid is exempt from the CIDB Regulations, the bid is subject to the Preferential Procurement Policy Framework Act, 2000 and the Preferential Procurement Regulations, 2017, the General Conditions of Contract (GCC) with its special conditions of contract, and, if applicable, any other legislative requirements.

Bid response documents are deposited in the tender box situated physically at:

Physical Address:
NRF Building, PRIOR TO CSIR Campus South gate, Meiring Naude Road, Brummeria, Pretoria, 0184.

Follow the signposts.

Bid box is located at NRF main entrance gate and is open 24 hours a day.

GPS coordinates: S 25.7557988, E 28.2738249,17

Dimensions of tender box opening: 900 cm wide and 1100 cm long

Addressed As Follows:
Bid number, bidder’s name, contact name, telephone number, e-mail address, and postal address.

Number of ORIGINAL bid documents for contract signing
2

Bidders must submit the above sets of original bid documents (including the bidder’s response to the specification and the bidder’s pricing) in hard copy format (paper document) to the NRF. This serves as the original master set for the legal contract document between the bidder and the NRF. The master set remains at the NRF and has precedence over any other copies in the case of any discrepancies within the other sets of documents. The bidders attach the originals or certified copies of any certificates stipulated in this document to these original sets of bid documents.

Number of EVALUATION copies (Mark pages as “Evaluation Copy” and number all pages sequentially):
5

TWO ENVELOPE SYSTEM
Yes

PRICE VALIDITY PERIOD FROM DATE OF CLOSURE
120 days

BRIEFING SESSION OR SITE VISIT DETAILS

Bid Number: NRF/CORP ICT 007/2018    Page 4 of 98    Ver. Standard 2018-6a clean
<table>
<thead>
<tr>
<th>Attendance:</th>
<th>Compulsory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date and Time</td>
<td>29 January 2019 at 14:00</td>
</tr>
<tr>
<td>Additional Site Inspection:</td>
<td>Bidders may conduct additional site inspections. Additional site inspections are to be arranged with the Employer or NRF Agent/Engineer at least 1 week prior to the required inspection date.</td>
</tr>
<tr>
<td>Venue</td>
<td>Albert Luthuli Auditorium NRF East Wing</td>
</tr>
<tr>
<td>Address</td>
<td>NRF Building, PRIOR TO CSIR Campus South gate, Meiring Naude Road, Brummeria, Pretoria</td>
</tr>
<tr>
<td>Contact Person</td>
<td>Darryl Lloyd</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bidding procedure enquiries are directed in writing to:</th>
<th>Technical information queries are directed in writing to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section</td>
<td>SCM</td>
</tr>
<tr>
<td>Contact person</td>
<td>Lebogang Mosoma</td>
</tr>
<tr>
<td>E-mail address</td>
<td><a href="mailto:Lebogang.mosoma@nrf.ac.za">Lebogang.mosoma@nrf.ac.za</a></td>
</tr>
</tbody>
</table>

**NRF’s Agent Managing this Contract is:**

<table>
<thead>
<tr>
<th>Agent</th>
<th>Delta Built Environment Consultants (Delta BEC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact person</td>
<td>Herman Malan</td>
</tr>
<tr>
<td>E-mail address</td>
<td><a href="mailto:herman.malan@deltabec.com">herman.malan@deltabec.com</a></td>
</tr>
</tbody>
</table>

**SUPPLIER INFORMATION**

<table>
<thead>
<tr>
<th>Name Of Bidder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postal Address</td>
</tr>
<tr>
<td>Street Address</td>
</tr>
<tr>
<td>Telephone Number</td>
</tr>
<tr>
<td>SUPPLIER INFORMATION</td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td>Code</td>
</tr>
<tr>
<td><strong>Cell Phone Number</strong></td>
</tr>
<tr>
<td>Code</td>
</tr>
<tr>
<td><strong>Facsimile Number</strong></td>
</tr>
<tr>
<td>Code</td>
</tr>
<tr>
<td><strong>E-Mail Address</strong></td>
</tr>
<tr>
<td><strong>VAT Registration Number</strong></td>
</tr>
<tr>
<td><strong>Tax Compliance Status</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>B-BBEE Status Verification Certificate</strong></td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>[A B-BBEE status level verification certificate/ sworn affidavit (for EMEs &amp; QSEs) must be submitted in order to qualify for preference points for B-BBEE – also refer to the SBD 6.1]</td>
</tr>
<tr>
<td><strong>Are you the accredited representative in South Africa for the goods/services/works offered?</strong></td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>[If yes enclose proof]</td>
</tr>
<tr>
<td>Is the entity a resident of the Republic of South Africa (RSA)?</td>
</tr>
<tr>
<td>Does the entity have a branch in the RSA?</td>
</tr>
<tr>
<td>Does the entity have a permanent establishment in the RSA?</td>
</tr>
<tr>
<td>Does the entity have any source of income in the RSA?</td>
</tr>
<tr>
<td>Is the entity liable in the RSA for any form of taxation?</td>
</tr>
</tbody>
</table>

If the answer is “No” to all of the above, then it is not a requirement to register for a tax compliance status system pin code from the South African Revenue Service (SARS) and if not register as per 2.3 below.
**BID SUBMISSION**

1.1 Bids must be delivered by the stipulated time to the correct address. Late bids will not be accepted for consideration.

1.2 All bids must be submitted on the official forms provided—(not to be re-typed) or in the manner prescribed in the bid document. Bid pages are bound to minimise risk of lost pages.

1.3 This bid is subject to the Preferential Procurement Policy Framework Act, 2000 and the Preferential Procurement Regulations, 2017, the General Conditions Of Contract (GCC) with its special conditions of contract, and, if applicable, any other legislative requirements.

1.4 The successful bidder will be required to fill in and sign a written contract form (SBD7).

**TAX COMPLIANCE REQUIREMENTS**

2.1 Bidders must ensure compliance with their tax obligations.

2.2 Bidders are required to submit their unique personal identification number (PIN) issued by SARS to enable the organ of state to verify the taxpayer’s profile and tax status.

2.3 Application for tax compliance status (TCS) pin may be made via e-Filing through the SARS website www.sars.gov.za.

2.4 Bidders may also submit a printed TCS certificate together with the bid.

2.5 In bids where consortia / joint ventures / sub-contractors are involved, each party must submit a separate TCS certificate / PIN / CSD number.

2.6 Where no TCS is available but the bidder is registered on the Central Supplier Database (CSD), a CSD number must be provided.

2.7 No bids will be considered from persons in the service of the state, companies with directors who are persons in the service of the state, or close corporations with members persons in the service of the state.

**ACKNOWLEDGEMENT OF READING EACH PAGE**

The bidder warrants by signature in this document that the bidder has read and accepts each page in this document including any annexures attached to this document.

**CENTRAL SUPPLIER DATABASE REGISTRATION**

The NRF requests bidders to register on the Central Supplier Database and to include in their bid their Master Registration Number (Supplier Number) in order to enable the NRF to verify the supplier’s tax status on the Central Supplier Database.

**CLARIFICATION**

If the respondent wishes to clarify aspects of this request or the acquisition process, they write to the contact officials listed under the enquiries section above. The National Research Foundation distributes the response to a clarification request to all respondents that have communicated their intention to bid (i.e. briefing session attendance register) within 2 working days of receipt of the query. The National Research Foundation does not provide the origin of the request to any party.

**RESPONSE PREPARATION COSTS**
The NRF is not liable for any costs incurred by a bidder in the process of responding to this Bid Invitation, including on-site presentations.

### TWO ENVELOPE SYSTEM

The NRF, in the interests of transparent procurement, utilises the two-envelope system to minimise any form of price bias in the technical selection phase (the first envelope) as the evaluators receive the price details (the second envelope with the SBD 3 (price schedule and detailed supporting pricing documentation) for price evaluation after completion of the technical selection stages. An outer envelope addressed as stated in this document encloses both envelopes.

### COLLUSION, FRAUD AND CORRUPTION

Any effort by Bidder to influence evaluation, comparisons, or award decisions in any manner will result in the rejection and disqualification of the bidder concerned.

### FRONTING

The NRF supports the spirit of broad based black economic empowerment and recognizes that achieving real empowerment is through individuals and businesses conducting themselves in accordance with the Constitution and in an honest, fair, equitable, transparent, and legally compliant manner. Against this background, the NRF condemns any form of fronting. The NRF, in ensuring that bidders conduct themselves in an honest manner will, as part of the bid evaluation processes where applicable, conduct or initiate the necessary enquiries/investigations to determine the accuracy of the representation made in the bid documents. The onus is on the bidder to prove that fronting does not exist, should the National Research Foundation establish and notify the bidder of potential breaches of any of the fronting indicators as contained in the Department of Trade and Industry’s “Guidelines on Complex Structures and Transactions and Fronting”. Failure to do so within a period of 7 days from date of notification will invalidate the bid/contract and may also result in the restriction of the bidder to conduct business with the public sector for a period not exceeding 10 years, in addition to any other remedies the NRF may have against the bidder concerned.

### DISCLAIMERS

The NRF has produced this document in good faith. The NRF, its agents, and its employees and associates do not warrant its accuracy or completeness. The NRF makes no representation, warranty, assurance, guarantee or endorsements to any provider/bidder concerning the document, whether with regard to its accuracy, completeness or otherwise and the NRF shall have no liability towards the responding service providers or any other party in connection therewith.

### GENERAL DEFINITIONS

“**B-BBEE**” means broad-based black economic empowerment as defined in section 1 of the Broad-Based Black Economic Empowerment Act;

“**B-BBEE status level of contributor**” means the B-BBEE status of an entity in terms of a code of good practice on black economic empowerment, issued in terms of section 9(1) of the Broad-Based Black Economic Empowerment Act;

“**Bid**” means a written offer in a prescribed or stipulated form in response to an invitation by the National Research Foundation for the provision of goods or services, through price quotations, advertised competitive bidding processes or proposals;

“**Broad-Based Black Economic Empowerment Act**” means the Broad-Based Black Economic Empowerment Act,
2003 (Act No. 53 of 2003);

"Contract" means the entire bid document inclusive of scope of work, specification, price conditions, price quote table, service delivery conditions, performance conditions with their key performance indicators, and general conditions when attached to the Standard Bidding Document 7 (SBD 7) which has been signed by the awarded bidder and the National Research Foundations;

“EME” means an Exempted Micro Enterprise in terms of a code of good practice on black economic empowerment issued in terms of section 9 (1) of the Broad-Based Black Economic Empowerment Act;

“Market Price” means tests to verify the offered prices are market related to the NRF in allowing the bidder to complete the work without risk of performance failure to the NRF and that the price provides the sustainability to the bidder.

“Functionality” means the ability of a bidder to provide goods or services in accordance with specifications including quality that deliver the set levels of performance functionality as set out in the bid documents.

“Proof of B-BBEE status level of contributor” means:
- B-BBEE Status level certificate issued by an authorized body or person;
- A sworn affidavit as prescribed by the B-BBEE Codes of Good Practice;
- Any other requirement prescribed in terms of the B-BBEE Act.

“QSE” means a qualifying small business enterprise in terms of a code of good practice on black economic empowerment issued in terms of section 9 (1) of the Broad-Based Black Economic Empowerment Act.

## THE BIDDING SELECTION PROCESS

### Stage 1 – Compliance to submission requirements

Bidders warrant that their proposal document has, as a minimum; the specified documents required for evaluating their proposals as set out in the Returnable Document List and conform to all the terms, conditions, and specifications as set out in this document. The NRF may allow clarification requests of certifications and documents stemming from legislative bodies for purposes of demonstrating legal compliance not used for the purposes of technical evaluation scoring and price ranking. The NRF may request from the bidder these documents during the period of evaluations, but must already be submitted and assessed by the time of making the final recommendation for contract award to the Bid Adjudication Committee.

The NRF treats all other departures as major disqualifying the bidder from the evaluation process.

### Stage 2 – Evaluation of Bids against Technical Specifications

Bidders achieving the minimum threshold or meets the exact specified requirements enter the Price/Preference scoring stage. The technical evaluation consists of the following steps:

**Stage 2A – Evaluation of Bids against Specifications including Quality (Desk top Review)**

The NRF evaluates each bidder’s written response to the specifications issued in accordance to published evaluation criteria set out in this document.

**Stage 2B – Technical Qualification (NRF Agent/Engineering)**

Where circumstances justifies it, the NRF conducts qualification either at site or on NRF premises having the bidder present evidence of meeting the specification in front of the BEC.

**Stage 2C – Due Diligence Research**

The evaluation team conducts research of the recommended bidder(s)’s submission(s) including the reference letters with external referees prior to making their recommendation and their CIDB grading.
Stage 3 – Evaluation of Market Relatedness of the Offered Prices

The NRF evaluates each bidder’s offered pricing at the costing level taking into account costed lines, coverage of the bid requirements.

Stage 4 – Price/Preference Ranking

The NRF compares the offered pricing of each qualifying bidder on an equal comparison basis equitable to all bidders. The NRF ranks the qualifying bids on price with lowest priced Bid receiving the maximum points (either 80 or 90) and the remainder ranked in relation to the lowest priced bid. The NRF adds the bidders’ claimed preference points as verified to the submitted preference claim form (SBD 6.1) to provide the final ranking for the award decision.

Stage 5 – Checking Tax Compliance

The NRF notifies the recommended bidder in writing where their tax compliance check reflects that they are non-compliant and provides the recommended bidder seven (7) working days to submit written proof from SARS of their tax compliance status or proof that they have made an arrangement with SARS to meet their outstanding tax obligations. Failure to deliver such written evidence of compliance results in the rejection of that recommended bid.

Stage 6 – Award and Contract Signing

The NRF nominates the bidder with the highest combined score for the contract award subject to the bidder having supplied the relevant administrative documentation.

Cancellation of the Bid prior to Award

The NRF cancels the Bid Invitation prior to making an award where

a. Due to changed circumstances there is no need for the specified procurement in the document, or
b. No bids meet the minimum required specification, or
c. A material irregularity occurred in the bid process, or
d. Where the price is too low/high with no bidder prepared to negotiate the price into the determined market price range.

SBD 1 SIGNATURE

NB: FAILURE TO PROVIDE / OR COMPLY WITH ANY OF THE ABOVE PARTICULARS MAY RENDER THE BID INVALID.

SIGNATURE OF BIDDER:

CAPACITY UNDER WHICH THIS BID IS SIGNED (Proof of authority must be submitted e.g. company resolution)

DATE:
### INTRODUCTION TO THE NRF

The National Research Foundation Act, Act 23 of 1998, establishes the National Research Foundation ("NRF") as the juristic person that makes this bid invitation and will contract with the awarded bidder. The Public Finance Management Act classifies the organisation as a Schedule 3A Public Entity.

### CONTRACT PERIOD

The contract period is six (6) years. Maintenance component commences 30 days after final delivery of supply and install of the specified equipment.

### CONTEXT OF THIS PROCUREMENT

The National Research Foundation (NRF) building located in Meiring Naude Road, Pretoria, is constructing a new data centre to replace the existing data centre. The NRF is projecting the new data centre to grow to double the equipment, and electrical load, than that of the current data centre.

As result, the NRF requires a new power supply solution for the new datacentre including a dedicated new generator installation and an Uninterruptable Power Supply (UPS), in a parallel configuration, with battery backup in addition to the generator.

### SITE INFORMATION

The site is situated at Meiring Naudé Road, Brummeria, Pretoria, in the Gauteng Province. The generators and UPS units are to be installed at the existing National Research Foundation Corporate Building (Not the RISA Building). The building is occupied, access controlled, and with manned boom gates at the entrance.

Vehicle access to the generator location are limited, with no road at the rear of the building. The contractor is to take note and ensure the equipment to be used to deliver and rig the generator is able to reach the generator location.

The UPS units and batteries are to be installed in the new Data Centre. The data centre is located on the ground floor of the NRF Corporate Building. The contractor is to ensure they can transport the UPS units, batteries, and cabinets to the new data centre. The site conditions are as follows:

- **a. Altitude/ Elevation**: 1.339 metres above sea level (4.393 ft.)
- **b. Ambient temperature range**: 30°C maximum/3°C minimum
- **c. Relative humidity**: 59%
- **d. Lightning**: Low

### DETAILED SPECIFICATION
GENERAL

Preliminary project plan
The bidder provides the preliminary project plan detailing the programme for the completion of this project indicating the critical path. This programme shall be in the form of a bar chart (Gantt chart) or equivalent time/activity form reflecting the proposed sequence and tempo of the various activities and the quantities that will be carried out every week under each of the elements, comprising the work for this contract. The programme shall indicate the point of commencing work operations which for this purpose the commence date is 1st February 2019 and the completion date is 30 days after commencement. An alternative programme with start date 1st February 2019 and completion date 0 days after commencement. This completion periods are the result of the critical necessity to have power to the data centre.

The Bidder shall also take into account the additional requirements stated in the Project Specifications when drawing up the programme. Details of the preliminary programme shall be appended to this Schedule.

General Standards and Regulations
All material and equipment supplied for this contract shall be new and the best of their respective kind. All new materials and equipment supplied, shall comply fully with the requirements laid down in the specification. The whole of the works shall be executed in accordance with and to approval of the NRF Agent/Engineer.

Apart from any other authority, which the NRF Agent/Engineer may have in terms of the contract, the NRF Agent/Engineer shall have the right to set the standard and to accept or reject part of the specified equipment depending on the quality of material and workmanship offered.

The contractor shall be notified if the quality of such materials and/or workmanship is not acceptable. In such an event, the contractor shall replace the specific part or repair it to the satisfaction of the NRF Agent/Engineer, all at the cost of the contractor. Such an instruction shall not exempt the contractor from any of his obligations in terms of the contract.

The installation shall be erected and carried out in accordance with legislation including the following:

a. The Occupational Health and Safety Act, 1993 (Act No 85 of 1993) and the regulations promulgated in terms of the Act,
b. The Code of Practice for the Wiring of Premises SANS 10142, with the latest amendments, issued by the South African Bureau of Standards,
c. City of Tshwane Metropolitan Municipality Electricity supply by law
d. Electricity Regulation Act, Act 4 of 2006 and Electricity Regulation Amendment Act, Act 28 of 2007
f. The local Municipality by-laws and Regulations as well as the regulations of the local Supply Authority.
g. The local Fire regulations.
h. The Regulations of the Department of Posts and Telecommunications.
i. The Standard Regulations of any Government Department or public service company where applicable.
j. SABS 150 - Insulated wire.
k. SANS 1091 - Colour standards for paint.
l. SANS 0142 - Wiring code of practice.
m. SANS 1474 - UPS units.
n. Screwed metallic conduit and accessories: SABS 1065, parts 1 and 2.
o. Plain-end metallic conduit and accessories: SABS 1065, parts 1 and 2.
p. Non-metallic conduit and accessories: SABS 950
q. SABS 0142.
r. SANS 342: Automotive diesel fuel,
s. SANS 8528 (Parts 1 - 12): Reciprocating internal combustion engine driven alternating current generating sets,
t. SANS 10089 (Parts 1 - 3): The petroleum industry,
u. SANS 60034: Rotating electrical machines,
v. NRS 098: Guidelines for the installation and safe use of portable generators on utilities’ networks (applicable to permanently installed standby generation)
w. The relevant SANS, BS and IEC and ISO supporting specifications referred to in the standard specifications.
x. The alternator shall comply with BS 5000 - Part 99 - 1973 or VDE 0530, as amended.
y. The demand ammeter conform to SABS 1299.

In addition the contractor shall at his cost issue all notices in respect of the installation to the local authorities, and shall exempt the client from all losses, costs or expenditures which may arise as a result of the contractor's failure to comply with the requirements of the regulations enumerated above.

The contractor is required to be conversant with the above-mentioned requirements. Should any requirements, by-law or regulation, which contradicts the requirements of this document, apply or become applicable during erection of the installation, the contractor shall immediately inform the NRF Agent/Engineer of such a contradiction. Under no circumstances shall the contractor carry out variations to the installation in terms of such contradictions without obtaining the written permission to do so from the NRF Agent/Engineer.

MAINTENANCE OF INSTALLATION

If during the said period the installation is not in working order for any reason for which the Contractor is responsible, or if the installations develops latent defects, he shall, upon being notified, immediately take steps to remedy the defects and make any necessary adjustments.

Should such stoppages however be so frequent as to become troublesome, or should the installation otherwise prove unsatisfactory during the said period the Contractor shall, if called upon by the NRF Agent/Engineer or the NRF, at his own expense replace the whole of the installation or such parts thereof as the NRF Agent/Engineer or the NRF may deem necessary with apparatus specified by the NRF Agent/Engineer or the NRF.

TESTS

After completion of the works and before first delivery is taken, a full test will be carried out on the installation for a period of sufficient duration to determine the satisfactory working thereof. During this period the installations will be inspected and the Contractor shall make good, to the satisfaction of the NRF Agent/Engineer, any defects which may arise. The Contractor shall provide all instruments and equipment required for testing and any water, power and fuel required for the commissioning and testing of the installations at completion.

WORKMANSHIP AND STAFF

Except in the case of electrical installations supplied by a single-phase electricity supply at the point of supply, an accredited person shall exercise general control over all electrical installation work being carried out. The
workmanship shall be of the highest grade and to the satisfaction of the NRF. All inferior work shall, on indication by the NRF Agent/Engineer and NRF employees, immediately be removed and rectified by and at the expense of the Contractor.

CERTIFICATE OF COMPLIANCE

On completion of the service, a certificate of compliance must be issued to the NRF’s Agent/Engineer in terms of the Occupational Health and Safety Act, 1993 (Act 85 of 1993).

ELECTRICAL WORKS SPECIFICATIONS

CABLES AND TRENCHING

The Contractor shall supply and completely install all distribution cables as indicated on the drawings, and listed in this document including its annexures. The storage, transportation, handling and laying of the cables shall be according to first class practice, and the contractor shall have adequate and suitable equipment and labour to ensure that no damage is done to cables during such operations.

The cable-trenches shall be excavated to a depth of 0,65 m deep below ground level and shall be 450 mm wide for one to three cables, and the width shall be increased where more than three cables are laid together so that the cables may be placed at least two cable diameters apart throughout the run.

The bottom of the trench shall be level and clean and the bottom and sites free from rocks or stones liable to cause damage to the cable.

The Contractor must take all necessary precautions to prevent the trenching work being in any way a hazard to the personnel and public and to safeguard all structures, roads, sewage works or other property on the site from any risk of subsidence and damage.

In the trenches the cables shall be laid on a 50 mm thick bed of earth. Cables and joints are inspected and verified by both parties prior to backfilling/covered with a 150-mm layer of earth before the trench is filled in.

All joints in underground cables and terminations shall be made either by means of compound filled boxes according to the best established practice by competent cable jointers using first class materials or by means of approved epoxy-resin pressure type jointing kits such as “Scotchcast” or equivalent. Epoxy-resign joints must be made entirely in accordance with the manufacturer’s instructions and with materials stipulated in such instructions. Low tension PVCA cables are to be made off with sealing glands and materials designed for this purpose which must be of an approved make. Where cables are cut and not immediately made off, the ends are to be sealed without delay.

The laying of cables shall not be commenced until the trenches have been inspected and approved. The cable shall be removed from the drum in such a way that no twisting, tension or mechanical damage is caused and must be adequately supported at intervals during the whole operation. Particular care must be exercised where it is necessary to draw cables through pipes and ducts to avoid abrasion, elongation or distortion of any kind. The ends of such pipes and ducts shall be sealed to approval after drawing in of the cables.

Backfilling (after bedding) of the trenches is to be carried out with a proper grading of the material to ensure settling without voids, and the material is to be tamped down after the addition of every 150 mm. The surface is to be made good as required.

On each completed section of the laid and jointed cable, the insulation resistance shall be tested to approval with an approved “Megger” type instrument of not less than 500 V for low tension cables.
Earth continuity conductors are to be run with all underground cables constituting part of a low tension distribution system. Such continuity conductors are to be stranded bare copper of a cross-sectional area equal to at least half that of one live conductor of the cable, but shall not be less than 4mm² or more than 70mm². A single earth wire may be used as earth continuity conductor for two or more cables run together, branch earth wires being brazed on where required.

CONDUIT AND ACCESSORIES

Unless other methods of installation are specified for certain circuits, the installation shall be in conduit throughout. No open wiring in roof spaces or elsewhere will be permitted. Existing infrastructure is to be used as far as possible. The conduit and conduit accessories shall comply fully with the applicable SABS specifications as set out below and the conduit shall bear the mark of approval of the South African Bureau of Standards.

- Screwed metallic conduit and accessories: SABS 1065, parts 1 and 2.
- Plain-end metallic conduit and accessories: SABS 1065, parts 1 and 2.
- Non-metallic conduit and accessories: SABS 950

All conduit fittings except couplings, shall be of the inspection type. Where cast metal conduit accessories are used, these shall be of malleable iron. Zinc base fittings will not be allowed.

Bushes used for metallic conduit shall be brass and shall be provided in addition to locknuts at all points where the conduit terminates at switchboards, switch-boxes, draw-boxes, etc.

Draw-boxes are to be provided in accordance with the “Wiring Code” and wherever necessary to facilitate easy wiring.

For light and socket outlet circuits, the conduit used shall have an external diameter of 20mm. In all other instances the sizes of conduit shall be in accordance with the “Wiring Code” for the specified number and size of conductors, unless otherwise directed in part 2 of this specification or indicated on the drawings.

The bidder will standardize on one manufactured type of conduit and conduit accessories throughout the installation.

Running joints in screwed conduit are to be avoided as far as possible and all conduit systems shall be set or bent to the required angles. The use of normal bends must be kept to a minimum with exception of larger diameter conduits where the use of such bends is essential.

All metallic conduit shall be manufactured of mild steel with a minimum thickness of 1,2mm for plain-end conduit and 1,6mm in respect of screwed conduit.

Under no circumstances will conduit having a wall thickness of less than 1,6mm be allowed in screeding laid on top of concrete slabs.

Bending and setting of conduit must be done with special bending apparatus manufactured for the purpose and which are obtainable from the manufacturers of the conduit systems. Damage to conduit resulting from the use of incorrect bending apparatus or methods applied must on indication by the NRF’s Agent/Engineer, be completely removed and rectified and any wiring already drawn into such damaged conduits must be completely renewed at the Contractor’s expense.

CONDUIT IN ROOF SPACES

Conduit in roof spaces shall be installed parallel or at right angles to the roof members and shall be secured at intervals not exceeding 1,5m by means of saddles screwed to the roof timbers.
Nail or crampets will not be allowed.

Where non-metallic conduit has been specified for a particular service, the conduit shall be supported and fixed with saddles with a maximum spacing of 450 mm. The Contractor shall supply and install all additional supporting timbers in the roof space as required.

Under flat roofs, in false ceilings or where there is less than 0.9m of clearance, or should the ceilings be insulated with glass wool or other insulating material, the conduit shall be installed in such a manner as to allow for all wiring to be executed from below the ceilings.

Conduit runs from distribution boards shall, where possible terminate in fabricated sheet steel draw-boxes installed directly above or in close proximity to the boards.

**SURFACE MOUNTED CONDUIT**

Wherever possible, the conduit installation is to be concealed in the building work; however, where unavoidable or otherwise specified, conduit installed on the surface must be plumbed or levelled and only straight lengths shall be used.

The use of inspection bends is to be avoided and instead the conduit shall be set uniformly and inspection coupling used where necessary.

No threads will be permitted to show when the conduit installation is complete, except where running couplings have been employed.

Running couplings are only to be used where unavoidable, and shall be fitted with a sliced couplings as a lock nut.

Conduit is to be run on approved spaced saddles rigidly secured to the walls.

Alternatively, fittings, tees, boxes, couplings etc., are to be cut into the surface to allow the conduit to fit flush against the surface. Conduit is to be bedded into any wall irregularities to avoid gaps between the surface and the conduit.

Crossing of conduits is to be avoided, however, should it be necessary purpose-made metal boxes are to be provided at the junction. The finish of the boxes and positioning shall be in keeping with the general layout.

Where several conduits are installed side by side, they shall be evenly spaced and grouped under one purpose-made saddle.

In situations where there are no ceilings the conduits are to be run along the wall plates and the beams.

Painting of surface conduit shall match the colour of the adjacent wall finishes.

Only approved plugging materials such as aluminium inserts, fibre plugs, plastic plugs, etc., and round-head screws shall be used for fixing saddles, switches, socket outlets, etc., to walls, wood plugs and the plugging in joints in brick walls are not acceptable.

**WIRING:**

Except where otherwise specified in this document, wiring shall be carried out in conduit throughout. Only one circuit per conduit will be permitted.

No wiring shall be drawn into conduit until the conduit installation has been completed and all conduit ends provided with bushes. All conduits to be clear of moisture and debris before wiring is commenced.

Unless otherwise specified in this document, the wiring of the installation shall be carried out in accordance with the “Wiring Code”. Further to the requirements concerning the installation of earth conductors to certain light points
as set out in the “Wiring Code”, it is a specific requirement of this document that where plain-end metallic conduit or non-metallic conduit has been used, earth conductors must be provided and drawn into the conduit with the main conductors to all points, including all luminaires and switches throughout the installation.

For socket outlet circuits the wiring shall comprise 4mm² conductors and a 2.5mm²-earth conductor. In certain instances, the sizes of the aforementioned conductors may be increased for specified circuits. Sizes of conductors to be drawn into conduit in all other instances, such as feeders to distribution boards, power points etc., shall be as specified elsewhere in this specification or indicated on the drawings. Sizes of conductors not specified must be determined in accordance with the “Wiring Code”.

The loop-in system shall be followed throughout, and no joints of any description will be permitted.

The wiring shall be done in PVC insulated 600/1000 V grade cable to SABS 150.

Where cable ends connect onto switches, luminaires etc., the end strands must be neatly and tightly twisted together and firmly secured. Cutting away of wire strands of any cable will not be allowed.

**DISTRIBUTION BOARDS**

For uniform appearance of switchboards, only one approved make of each of the different classes of switchgear mentioned in the document shall be used throughout the installations.

All busbars, wiring, terminals, etc., are to be adequately insulated and all wiring is to enter the switchgear from the back of the board. The switchgear shall be mounted within the boards to give a flush front panel. Cable and boxes and other ancillary equipment must be provided where required.

Clearly engraved labels are to be mounted on or below every switch. The working of the labels in English, is to be according to the lay-out drawings or as per NRF Agent/Engineer’s requirements. Flush mounted boards to be installed with the top of the board no higher than 2,0m above the finished floor level.

**EARTHING OF INSTALLATION**

Installations shall be effectively earthed in accordance with the “Wiring Code” and to the requirements of the supply authority. All earth conductors shall be stranded copper with or without green PVC installation.

**Sub-distribution boards**

A separate earth connection shall be supplied between the earth busbar in each sub-distribution board and the earth busbar in the Main Switchboard. These connections shall consist of a bare or insulated stranded copper conductors installed along the same routes as the supply cables or in the same conduit as the supply conductors.

**Sub-circuits**

The earth conductors of all sub-circuits shall be connected to the earth busbar in the supply board in accordance with SABS 0142.

**Non-metallic Conduit**

Standard copper earth conductors shall be installed in the conduits and fixed securely to all metal appliances and equipment, including metal switch boxes, socket-outlet boxes, draw-boxes, switchboards, luminaires, etc. The securing of earth conductors by means of self-threading screws will not be permitted.

**Connection**

Under no circumstances shall any connection points, bolts, screws, used for earthing be utilised for any other
purpose. It will be the responsibility of the Contractor to supply and fit earth terminals or clamps on equipment and materials that must be earthed where these are not provided.

Unless earth conductors are connected to proper terminals, the end shall be tinned and lugged.

**GENERATOR**

**GENERATOR SCOPE OF WORKS**

The generator scope of work comprises of the following:

a. The supply, delivery, off-loading, installing, testing, and commissioning of two new diesel generators, dedicated to the data centre and its cooling system, including automatic transfer switch, proposed cable routing, and new distribution board for the data centre.

b. The two diesel generators are to have 40kVA continuous rated (45kVA standby rated) at a power factor of 0.8. The diesel generator, and redundant generator, is to provide backup power to the new data centre, located at the NRF building at the CSIR complex. The generators are to be housed in an enclosure with an IP rating of 65 or greater.

c. The diesel generators shall comply with the following (more detailed specifications are provided in the generator specification section of this document):
   a. Continuous (prime) power 40 kVA
   b. Standby power 45 kVA
   c. Power Factor 0.8
   d. Voltage 400 volts
   e. Phases 3

d. Supply and install of all material required for the construction of the concrete base for the mounting of the diesel generators.

e. The generators is to have the fuel catchment tank, equivalent to the generator’s main fuel tank in capacity.

f. The diesel generator shall be located/ placed near the existing 600 KVA generator.

g. The electrical cables (Main power cable from generator to main DB, 1x 35mm² PVC/SWA/PVC 4-core cable with 25mm² BCEW, as well as a pilot cable to sense mains power supply availability, 1x 6mm² PVC/SWA/PVC 4-core cable with 6mm² BCEW) will be installed under this contract. The installer of the generator shall ensure that adequate sleeves from the edge of the installation are provided to the generator for the required cables.

h. The generator is to be connected by a modbus connection to the building’s existing BMS installation. The configuration and integration of the generator controller to the system will be done by the installer. The installer of the generator shall ensure the device software is up to date, provide adequate sleeves, and install modbus cables to the system.

i. The generator system is to be supplied with its own GSM module (with a 6 year SMS contract). The GSM module will alert the selected personnel of all generator-related events including loss of main power (generator start-up), start-up failures, generator failures,

j. Two generators shall be installed for redundancy purposes. The generators shall be installed in a master/slave configuration. The master controller shall ensure the slave generator is started and power is supplied by the slave controller/generator in the event that the main generator is unable to supply power.

**DIESEL GENERATOR SPECIFICATION**

The work to be carried out comprises of the install and commissioning of 40 kVA, 0.8 power factor, continuous
rated (45 kVA, 0.8 power factor standby rating), diesel generators.

GENERAL REQUIREMENTS
The generator installation shall comply and the work shall be executed in accordance with legislation including the latest edition of the following:

- SANS 342: Automotive diesel fuel,
- SANS 8528 (Parts 1 - 12): Reciprocating internal combustion engine driven alternating current generating sets,
- SANS 10089 (Parts 1 - 3): The petroleum industry,
- SANS 60034: Rotating electrical machines,
- NRS 098: Guidelines for the installation and safe use of portable generators on utilities’ networks (applicable to permanently installed standby generation)
- The relevant SANS, BS and IEC and ISO supporting specifications referred to in the standard specifications.

GENERATOR ENCLOSURE
Generator enclosure shall be constructed of mild steel plate of not less than 2 mm in thickness and shall be mounted on a 6 mm steel channel under base for bolting down onto the concrete plinth. The enclosure is to be rated IP65 or greater.

The enclosure shall be powder coated after being treated as follows:

- The base of the diesel generator shall be hot dipped galvanised and then epoxy tar coated before being painted.
- The inside, facia panels, frames etc. shall be painted with two coats of white baked enamel

Bolts and nuts used shall be stainless steel, cadmium plated or copper. No galvanised bolts, nuts, and washers to be used.

GENERATOR PLINTHS
The contractor shall conduct minor earthworks to provide a flat area for the plinth. The contractor shall supply all the high strength concrete, rebar, and all material required for and shall cast the plinth for the generator set plinth. The plinth must be of sufficient size i.e. minimum of 4m x 2m to take the weight of the two generators, enclosure, and space to conduct maintenance in. The NRF Agent/Engineer to verify the completion of earth works and to obtain from the NRF Building Maintenance the location of cables and geological data for the flat area on which the plinth is to be built.

The contractor will have a professional certify that the plinth will hold the two generators and provide this to the NRF Agent/Engineer for verification prior to installing the generator. constructs with

GENERATOR INSTALLATION
Two layers of 5 ply malthoid shall be installed between the underbase of the diesel generator and the plinth when the diesel generator is installed.

GENERATOR EARTHING
A copper earth bar, 50mm x 6 mm and of suitable length shall be installed in generator enclosure.
GENERATOR DANGER SIGNS

The requirements of Electrical Machinery Regulation 4 of the "Occupational Health and Safety Act, 1993" (Act No 85 of 1993) shall be complied with. All doors shall be fitted with a 150 x 100 mm "Danger" cast aluminium sign with letters and figures protruding at least 2 mm. The signs shall have a red background.

GENERATOR DRAWINGS AND INFORMATION

The following drawings and information shall be included:

- A drawing indicating all dimensions of the generator enclosure, the size of and layout
- A drawing indicating the dimensions of the base as well as a drawing of the base required for the generator.

DIESEL GENERATOR SPECIFICATIONS

Rating

The rating of the standby power installation shall be such that the prime mover and the alternator/s with all deductions for auxiliaries are amply rated for the site electrical output, load characteristic and power factor as specified in the detail specification.

Operation requirements

The standby power installation shall automatically take over the load in the event of a mains failure, under voltage or any abnormal voltage condition on any one or more phases after this condition has persisted for a preset (but adjustable) period.

A control system shall be provided which shall, for the two generators, have a master/slave configuration. The control unit (as a system) shall:

- Monitor the mains continuously.
- In the event of any abnormality (parameters preset but generally adjustable) initiate the disconnection of the load from the mains supply.
- Start the diesel alternator set.
- Transfer the load to the standby power installation as soon as the alternator output is within specified limits and stable.
- Reconnect the load to the mains after the stable re-establishment of the mains.
- Monitor all functions and operations of the prime mover and the alternator and, where practical, ancillary equipment during operation and standby modes to ensure the safety of the installation.
- Ensure automatic take-over by the redundant (slave) generator in the event of a failure of the main (master) generator to start up.
- The control system shall be fitted with a GSM connection module and alert the NRF of any alarm conditions present.
- The control system shall be able to accept a diagnostic request over GSM communication and provide a report on the generator(s) status.
- The control system shall be provided with Modbus communication capabilities for connection to the central BMS system.

ENGINES
General
The prime mover shall be a diesel fuelled, compression ignition, direct injection, and four-stroke industrial engine designed for stationary duty.

The engine shall be rated for the site electrical output, load characteristics and power factor as specified. The derating of this engine for site conditions shall be strictly in accordance with BS 649 - 1958 as amended to date.

The output of the engine under the specified site conditions shall be the net available output after allowance for all auxiliary equipment including air filter, radiator and fan, oil pump, water pump, battery charging alternator, governor, etc., has been made. The engine shall be rated for diesel fuel complying with BS 2869 - 1970 as amended, Class A1 or SABS 342 - 1969, as amended, for diesel fuel with a minimum octane number of 40 and a minimum net calorific value of 10 000 kcal/kg.

The engine shall be capable of delivering an output of 110% of the specified electrical load at the same speed for one (1) hour in any period of 12 hours consecutive running.

The starting period from either automatic or manual switching until the taking over by the generating set of a load equal to the specified site electrical output shall not exceed 45 seconds. The load acceptance shall comply with the requirements stated in the specifications.

The engine speed shall be 1 500 to 2000 rpm.

The engine and installation shall be of neat appearance and all water, lubricating and diesel oil lines, filters and stop cocks shall be leak free.

All service connections to the engine shall be flexible to allow the free movement of the set and to prevent the transmission of vibration to the building or other structural elements.

All engine flexible or rigid piping not heat resistant shall be protected against damage by radiant heat.

Engine wiring shall be of the heat-resisting type.

The crankcase vent pipe shall terminate inside the low voltage chamber above the drip tray to collect condensate.

All moving parts shall be mechanically protected against accidental contact.

It shall be the responsibility of the Contractor to ensure the dynamic system comprising engine, flywheel and alternator rotor function as a unit and that the vibration stresses in the crank and rotor shafts shall not exceed the tolerances set by the manufacturers. The NRF Agent/Engineer to verify during testing.

The technical data sheets shall state the specified fuel consumption of the complete set with auxiliary equipment in kg/kWh of alternator output at 100%, 75% and 50% load to an accuracy of ± 10%. These figures shall be guaranteed and proved during site tests.

The engine shall be fitted with a flywheel having a moment of inertia which will allow the cyclic irregularity of the set to fall within the limits specified by BS 649 - 1958, as amended.

The flywheel shall be covered by a suitable hood.

Lubrication
The engine shall have a forced feed pressure lubrication system adequately rated to supply circulating lubrication oil to all bearings, gear trains, and important moving parts.

The filter(s) shall be suitable for use with detergent type lubricating oils and shall be fitted between the lubricating oil pump and the engine circuit. It shall be equipped with replaceable elements capable of 500 hours working time.
without attention and shall be placed for easy access and maintenance. The NRF Agent/Engineer to verify and sign off that this is achieved.

An automatic low oil pressure cut-out system which will de-energise the stop solenoid on the engine and give the alarm as indicated shall be fitted.

An oil pressure gauge shall be fitted in the main lubrication oil circuit after the oil filter(s).

A semi-rotary hand operated sump drain pump shall be fitted if draining the sump is difficult. The drainpipe and shut-off valve shall be placed in a convenient position outside the bedplate frame to facilitate drainage. The NRF Agent/Engineer shall be advised on whether additional concrete plinths are required for the generator set, in order to drain the sump properly.

A stainless steel or galvanised mild steel, removable, drip tray shall be placed under the engine. The tray must be large enough to catch a drip from any part of the engine and must be at least 25 mm deep.

The contractor shall include the first fill of all lubricating oils and supply and install all filter elements.

**Cooling**

A water-cooled engine shall be provided.

Careful attention shall be paid to the cooling system and the building requirements to accommodate the cooling system.

Radiators shall be heavy duty, air blast tropical type, and pressurised radiators, adequately sized for continuous full load operation of the set. The radiator fan may be either engine or motor driven and shall be complete in all respects including fan, drive, guards, filling and drain connections. The fan shall be arranged to draw cooling air from the atmosphere and exhaust the air to atmosphere. The capacity of the fan shall be sufficient to provide the required engine cooling and canopy ventilation.

Engine jacket water shall be circulated by an engine mounted centrifugal pump which is driven by the engine.

Water-cooled engines shall be fitted with a water temperature gauge and an engine over-temperature cut-out system. A high engine water temperature cut-out system only is not acceptable. In the case of an air cooled engine the over-temperature protection shall be derived from the oil-temperature. For both water and air cooled engines the over temperature protection shall de-energise the engine stop solenoid on the engine and give the required alarms.

**Engine fuelling**

An engine-mounted, manual fuel pump shall be fitted.

The governor-controlled fuel injection pump(s) shall be fitted between the lift and injection pumps and shall be arranged for easy access and easy maintenance.

A micro filter with replaceable elements suitable for the full flow rate of the injection pump(s) shall be fitted between the lift and injection pumps and shall be arranged for easy access and easy maintenance.

The filter element shall be capable of filtering out particles down to 5 microns in size.

An additional heavy duty primary filter (sludge filter), suitable for the full flow rate of the fuel pump, shall be fitted in the fuel line between the fuel tank and the lift pump. The filter shall be rated for 500 hours service without attention. The filter shall be arranged for easy access and maintenance.
Interconnection fuel piping shall be neatly run in copper tubing from the sludge filter to the other component parts of the fuel system.

The overflow from the engine fuel and injection pumps shall be returned to the fuel tank via a steel return pipe.

All piping shall be securely fixed by means of saddles and clamps.

Connections between static and vibrating components shall be flexible.

A continuously rated fail-safe engine-stop solenoid (energised to run), shall be provided. If a separate short time rated pull-in winding is employed, the linkage must ensure transfer to the full-time rated hold-in winding. The engine protective devices shall cut off the solenoid hold-in current and shut the engine down.

Should the engine require a particular grade of fuel, this shall be clearly stated.

**Combustion air**

The engine shall be fitted with a high efficiency air filter adequately sized for 500 hours running without attention.

Dry type, cartridge air filters are preferred and, if offered, shall be complete with a service indicator.

**Speed governing**

A mechanical speed governing device will be sufficient if the speed can be controlled within 4.5% tolerance over the load spectrum or else solid state isochronous electronic speed governor to Class A1 of BS 649 -1958, as amended, or better is required unless stated in the detail specification.

Woodward EG, Barber-Coleman or equivalent and approved governors shall be provided with:

- Steady state speed bank
- 0.25% isochronous control
- Speed regulation (droop)
- Externally adjustable 0% to 15%.
- Operating voltage
- 24 Volt DC unless starting battery bank nominal voltage is different in which case the operating voltage is to be the same as the nominal starter motor voltage.

When commissioning the set, the normal nominal speed shall be accurately set with the aid of a frequency meter.

**4.2.5.7 Exhaust gas**

The exhaust gases shall be ducted into the atmosphere through insulated piping and an exhaust silencer.

The contractor shall consult with the NRF Building Maintenance to the exhaust ducting of the current generator and the layout of all piping and cables within the region of the siting of the plinth of the new generators. The exhaust gases shall be ducted into the atmosphere in the same manner as the current generator being up to the top of the adjacent building and the gases are ducted into the atmosphere from the top of the building’s roof.

The silencer shall be of such a size and construction that sound level measurements taken within two meters of the exhaust opening shall not exceed 70 dB absolute.

The silencer shall be of stainless steel construction.

The silencer shall be fixed independently of the exhaust pipe and engine and all materials including brackets, hanger/s clamps, etc., to support the entire exhaust system form part of this contract.

The exhaust pipe diameter shall be sufficiently sized to ensure that the back-pressure limits of the engine are not exceeded. Exhaust gases shall be expelled into the open air.
A stainless steel, concertina type, flanged, flexible section shall be installed between the exhaust manifold and the exhaust line to allow relative movement between the engine and exhaust pipe as well as thermal expansion and contraction without placing any strain on the exhaust manifolds and silencer. Except for the length of flexible exhaust pipe mentioned above the exhaust pipe shall be of rigid construction. All bends shall have a radius of at least two and a half times the pipe diameter.

Where the exhaust pipe arrangement specified above passes through the enclosure a weather-proof anti-vibration seal complete with insulation and/or expansion gasketing shall be provided.

The exhaust system shall be lagged with 25 mm thick asbestos rope, cloth wrapped and thereafter clad in bright polished stainless steel sheeting. On bends the cladding shall be segmented to provide a semi-smooth neatly curved appearance.

The contractor shall obtain the NRF Agent\Engineer and the NRF Building Maintenance Supervisor approval of the ducting route into the atmosphere prior to proceeding with the designed routing.

**Starting (electrical)**

The engine shall be easily started from cold under summer as well as winter conditions without the use of special starting equipment.

Water-cooled engines shall be fitted with thermostatically controlled immersion heaters capable of maintaining jacket water temperature to ensure successful starting in the lowest ambient temperature stated. The rated heater voltage shall be the same as the mains voltage and shall be wired to the control panel and the circuit protected by suitably rated circuit breakers or fuses.

A 24 Volt DC starter motor, fitted with an approved positive engagement device, shall be used. The motor shall operate from a battery set and will be controlled by the panel mounted starter control circuitry.

Arrangement shall be made to ensure that the starter motor cannot be engaged unless the engine is at rest, i.e. the starting system shall be blocked while the engine is running or running down.

The contractor shall provide all necessary auxiliary equipment, solenoids, bendixes etc. for the full automatic operation of the system.

**Battery**

The set shall be supplied with a fully charged Plante type lead-acid battery rated for the voltage and current requirements of the starting motor(s) and control equipment, but shall not be rated for less than 150 ampere hour.

The battery discharge capacity at 5°C shall be such that the full cranking current can be drawn for 60 seconds with cell voltage falling to not less than 1,5 Volt, taking into account locked motor current and minimum motor cranking voltage. Where the control equipment is operated from the engine starting battery, the battery voltage, after 6 starting attempts at 5°C (i.e. 6 starting cycles of 10 seconds each shall be sufficient to provide satisfactory operation of the control equipment and 5 rest periods of 10 seconds in between starts).

The cells shall be of the transparent case type, 2 Volts per cell, and shall be mounted on an angle iron frame of sufficient size to allow 50 mm clearance between units for ventilation and mounted as close as possible to the starter motor.

The battery shall be charged from an engine driven brushless alternator/rectified with automatic rate control during engine operation.

While the set is stationary, the battery shall be charged via a constant voltage charger which is mounted in the
control panel.

A 5 litre plastic container for battery distilled water, a funnel and a hydrometer shall be provided on a suitable shelf, bracket or cupboard in the low voltage chamber.

**Engine protection**

The necessary sensors for low oil pressure protection and engine over-temperature protection shall be fitted. Over speed and/or under speed protection shall be derived from the frequency sensor.

A fail-safe series circuit for the engine-mounted protection devices shall actuate the fuel cut-off solenoid in the event of the operation of a sensor, failure of a sensor, breaks in wiring or failure of the associated timing or control circuits.

A fail-safe device shall bypass the protection circuits during engine cranking and the protection circuits shall become operative with the start-discontinue signal. This device and the associated protection control circuitry shall be incorporated in the control section of the generator panel.

The sensors shall also operate the parallel protection circuits as stated.

All protection devices shall cut off the engine-run solenoid hold-in current to shut the engine down. Provision must be made in the control circuitry of each engine to disconnect the load immediately should the engine shut down for any reason whatsoever. The alternator must not be connected to load during the "run down" period.

**Engine mounted equipment**

The following engine mounted equipment shall be provided:

One tachometer mounted on the engine panel. Size ± 50 mm

One safety control system to shut down the engine in case of excessively high engine over speed.

One set of pressure gauges mounted on the engine panel to indicate the following:

- Fuel oil pressure
- Lubricating oil pressure on pump discharge

One set of dial type temperature gauges mounted on the engine panel to indicate the following:

- Lubricating oil temperatures in case of air cooled engines
- Jacket water temperatures in case of water cooled engines

**Engine/alternator coupling**

The engine shall be directly or closely coupled to the alternator without a reduction gear box and the engine power shall be correctly matched to the alternator output at 1 500 rpm.

The coupling shall be by means of a flange adaptor ring or bell housing within which a shock absorbing flexible coupling shall be fitted.

**ALTERNATORS**

The alternator shall be a 4 pole, self-excited, brushless, 3 phase, 4 wire, and 50 Hz alternator complying with BS 5000 - Part 99 - 1973 or VDE 0530, as amended.

**Rating**

The site rating of the alternator shall not be less than the site rating of the prime mover.
The alternator shall be capable of delivering the output specified in the specification continuously as well as on
overload of 10% for one (1) hour in any period of twelve (12) hours consecutive running under the site conditions
as stated without exceeding the temperature limits of BS 5000 Part 99 -1973, as amended.

The kVA rating shall be derated strictly in accordance with BS 5000 - Part 99 - 1973, as amended.

**Insulation**

The alternator shall be tropically insulated, i.e. special precautions shall be taken against the attack by harmful
fungi on the insulation.

Both stator and rotor windings shall be fully impregnated for tropical climate and shall have an oil resisting anti-
tracking finishing varnish.

The insulation provided shall be Class F rated for Class B or better throughout.

**Enclosure**

The alternator shall be self-ventilated, screen protected and of drip-proof construction.

**Shaft**

The shaft shall be horizontal for direct coupling to the diesel engine.

The shaft shall be fitted with two greasable, dustproof, ball, or roller bearings capable of running without attention
for a minimum of 500 hours.

A second shaft extension is not a requirement but would be an advantage for unforeseen additions such as
tachogenerators.

**Main windings**

The main field shall be of the rotating salient pole type  and shall employ laminated poles in order to reduce eddy
current losses to a minimum.

The rotor shall be dynamically balanced and the windings, excitation and regulating equipment shall be suitably
braced to allow an over speed of 20%.

**Damper windings**

Brazed copper damper windings shall be provided on the main field poles.

The alternator damper windings shall allow an unbalanced load of 25% under steady state conditions.

**Winding terminations**

All alternator windings shall terminate in a suitable terminal box with removable cover plate. The terminal box shall
be large enough to accommodate the specified cables and cable glands.

**Excitation**

The alternator shall be provided with brushless, solid state excitation and automatic voltage regulation.

Excitation shall be provided by a rotating-armature AC exciter, flange-mounted on the alternator shaft on the non-
drive side.
The rotor-mounted 3 phase AC exciter and full-wave rotating rectifier bridge shall supply a DC field current controlled by a solid state Automatic Voltage Regulator (AVR). The inherent damping of the exciter shall limit overshoot and hunting.

The rotating silicon diodes shall be protected from voltage spikes by means of a selenium diode which shall rotate with them. Alternative surge suppression means may be submitted for consideration.

In cases where a compounding circuit is provided, it shall be possible to remove the AVR when it fails and by a simple adjustment run the machine on compound regulation only.

**Steady state voltage performance**

The voltage regulation shall be better than ± 1% of the nominal voltage specified at all loads with a power factor between unity and 0.8 and within the engine speed variations of 4.5% between 0% and 100% of full load.

The steady state voltage regulation may deteriorate under the unbalanced conditions as specified under Damper Windings above but shall not be worse than ± 3% under steady state conditions with phase power factors individually varying between 0.8 to unity power factor and engine speed variations of 4.5%.

**Transient voltage performance**

The excitation system shall be designed to promote rapid voltage recovery following the sudden application of full load.

With instantaneous application of full load (70% in the case of turbocharged engines) from the no-load condition the voltage drop must not exceed 10% and recovery to rated voltage must be within 300 milliseconds.

The voltage recovery and voltage dip specified shall apply on site for the engine offered and do not refer to laboratory test conditions where large prime movers may be used.

**Voltage adjustment**

Alternator voltage adjustment over a range of ± 5% of nominal rated voltage shall be provided.

**Wave form**

The output wave form shall be sinusoidal and the deviation from a true sine wave shall not exceed 5% when measured in accordance with BS or VDE standards.

The line-to-line harmonic content or distortion (Distortion Factor) when measured between any of the phases at any linear load capacity of the alternator shall not exceed 4%.

**Overload factor**

The overload capacity of the alternator shall be such as to allow overloads of 10% for one hour or 50% for two minutes or any straight line interpolated intermediate overloading condition in between once every twelve hours.

Unless exactly equally rated, the site rating of the alternator shall always exceed the net site rating of the prime mover (as specified under clause - "Engines (General)") taking due cognisance of the overload factors applying in both cases. For power factors of 0.8 or higher it shall therefore not be possible for the alternator to be damaged by overloading.
Radio interference suppression
The alternator output shall comply with the RF suppression requirements of BS 800 - 1977, and the requirements of the NRF, the Department of Posts and Telecommunications and any other statutory body having authority.

Main and sub frames
The engine and alternator shall be built together on a common galvanised mild steel frame. Adequate anti-vibration mounting shall be used for the specific installation.

The base frame shall be placed directly on a concrete floor and shall be bolted to the floor.

The frame must be high enough off the floor to facilitate easy installation and removal of the drip tray specified and for the draining of engine oil.

The outer casing of the alternator, the engine and all parts of the base frame shall be earthed to the main low voltage chamber earth bar.

Lifting and transportation
The frame shall be of rigid construction enabling the complete set to be transported without dismantling.

The frame shall have lifting hooks or holes to facilitate handling during transportation and when positioned on site.

CONTROL SYSTEM

General
The generator installation shall be complete with a controller for each generator provided, configured in a master/slave setup. The control panel shall be freestanding, all metal construction with a rated level of protection of IP55 or greater.

The control panel shall be divided into two compartments to separate the instrument and control circuits from the power circuits.

The control system shall be configured in a master/slave installation between the two generators. The master controller shall be connected to the building’s BMS installation. The integration to the BMS system shall be done by others.

The master controller shall be responsible for directing power from the generators to the New Data Centre’s automatic change-over.

The control panel shall have a GSM module. The GSM module shall alert, by SMS, any urgent alarm conditions, as set out in section Protection and alarm module, arising on either of the generators.

The GSM module shall also accept SMS commands, from registered numbers programmed onto the system, reply with information requested. SMS requests shall include status requests, recent alarm conditions, and fuel levels of the generators.

Control panel equipment
All meters shall be either 96 mm 240° cirsacle instruments by Reyrolle, Gardner, Hartmann-Braun or equivalent and approved or alternatively rectangular linear scale 64 mm x 192 mm (approximately) instruments by Reyrolle, Hartmann-Braun, Goosen or equivalent and approved.

The following flush mounted equipment shall be incorporated in the control panel, together with the associated
apparatus:

- Three maximum demand ammeters, 96 mm x 96 mm with a red line at the full load amperes, conforming to SABS 1299.
- Frequency meter 45-55 Hz with prominent mark on 50Hz
- Protection and alarm devices as specified.
- Battery charger: Automatic trickle and boost and shall include overload protection, silicon diode full wave rectifiers, voltage surge suppressors, DC indication ammeter and voltmeter plus ON/OFF switch with automatic switching from normal mains supply to alternator.
- One flush voltmeter scaled 0 - 400 volt, indicating alternator voltage with a multi-position voltmeter selector switch with one off position, connecting the voltmeter between the various phases and phases and neutral.
- One flush maximum demand indicating kW meter scaled to suit alternator output. At 100% and 110% of engine output the scale is to be cross-hatched with red lines. Above 110% of rated engine output the scale is to be coloured solid red.
- One flush power factor meter.
- "Running hours" meter with cyclometer counter.
- Correct rated main MCB with overload and short circuit protection
- Automatic start stop cranking module with a four position mode selector OFF, MANUAL, AUTO and TEST with START and STOP pushbuttons operating on the manual mode.
- Voltage failure relay monitoring the voltage and phase rotation of the main supply working in conjunction with the AUTO mode of the automatic start/stop cranking.
- Over and under voltage relay, phase unbalance relay, phase reversal relay and earth fault relay.
- One set of potential fuses.

All instruments shall match and shall be clearly scaled for maximum legibility.

Sequence of operation
In the event of a mains failure the timing of the detailed sequence shall be as follows:

Mains disconnection
The automatic change-over switch, located at the NRF new data centre shall perform a positive disconnecting of the mains is immediately after detection of a fault. Faults include single phasing, incorrect phase sequence or phase angle deviations.

Engine start command
Following a mains fault a start command shall be given to the engine after an adjustable delay of 0 to 60 seconds (preset at 10 seconds).

If the mains fault is cleared before the expiry of the adjustable start delay period the start command shall not be given.

Instead, a command shall immediately be given for the immediate changeover by the Mains/Standby transfer switch back to the healthy mains.

Start attempts
Three start attempts by the starting system of 10 seconds each with a 15 second interval between each attempt shall be provided.
Restoration of the mains after the first engine start command has been given shall not interrupt the complete starting and power transfer sequence.

**Alternator output CB closure**
Assuming the engine has started correctly the alternator output circuit breaker, or contactor as specified, shall be closed approximately two seconds after the output has reached voltage and frequency to specification, or, alternatively, immediately after the output is stable and within specification.

Restoration of the mains or clearance of the mains fault shall not inhibit the transfer from Mains to Standby; the sequence shall however advance to a "mains restored" situation.

**Mains to standby changeover**
A changeover command shall be given to mains/standby transfer switch immediately after the alternator output ACB closure if the mains fault has not been cleared.

**Mains restored, standby to mains changeover**
A changeover command shall be given to the mains/standby transfer switch after a period adjustable from 10 to 60 minutes (preset at 10 minutes) after restoration of the main supply.

**Engine no-load rundown**
An engine stop command shall be given after an engine cooling period of no load adjustable from 5 to 15 minutes (preset at 5 minutes).

**Auto/test/manual/off selector switch**
A key operated, four position selector switch shall be provided.

**Auto**
In this position, the generator and control circuit shall operate automatically under control of one or more of the logic modules detailed hereunder.

**Test**
The generator shall start automatically but the alternator circuit breaker shall not close. The mains control shall not be affected.

It shall be possible to prove the operation of the automatic synchronising unit (if provided) without closing the alternator circuit breaker.

The operation of the engine/alternator protective devices shall be provided by simulating a fault by means of test buttons.

**Manual**
In this position all automatic control circuits shall be inoperative. The set shall be started from a pushbutton or switch on the control board. The alternator circuit breaker, voltage and engine speed shall also be controlled by pushbuttons or potentiometers.
Off
In this position the set shall be completely disconnected from the automatic control for cleaning and maintenance purposes. The mains control selection shall, however, still operate normally.

Mains voltage sensing module
A mains voltage sensing module shall be provided. This shall monitor all three phases and the neutral both individually and jointly and shall initiate the starting sequence upon failure or malfunction of any one or all three phases and the neutral.

A separate cable shall be installed from the building main DB to the generator set to provide a connection from the main power for sensing purposes.

The over-voltage drop-out shall be adjustable between 110% and 120% of the normal supply voltage (380 V) and adjusted to 110%.

The under-voltage drop-out shall be adjustable between 80% and 90% of the normal supply voltage (380 V) and adjusted at 90%.

Phase unbalance sensing shall be provided in the form of a phase unbalance monitor. A phase angle unbalance shall be adjustable between 5 and 20% and preset at 5%.

Alternator voltage sensing module
An alternator voltage/frequency sensing module shall be supplied.

The module shall provide voltage monitoring features as detailed above.

The unit shall incorporate a frequency monitor, adjustable to within limits of \( \pm 10\% \) of 50 Hz.

Three separate outputs from the module shall be provided: one for voltage and two for frequency. These outputs shall initiate operation of the over speed, under speed, as well as abnormal voltage trip and alarms but shall be sufficiently delayed to overcome short time voltage or frequency variations.

Visual monitoring facilities in the form of LEDs shall be provided for voltage and frequency.

Timing module
A time delay unit which upon mains failure, initiates start delay of 0 - 60 seconds (set at 15 seconds) shall be provided. If the mains should return during the start delay, the start-up cycle shall not proceed.

Start control module
A control module incorporating the start command circuits shall be provided which shall, in the event of a power failure as sensed by the mains voltage sensing module and the mains having been restored by the time the start delay timer has elapsed, initiate the automatic starting sequence and thereafter prevent interruption of the starting sequence even if power is restored before starting is achieved.

The control panel, after the delay start timer has timed out, shall initiate three 10 second attempts with a 15 second delay between each attempt.

A protection and alarm circuit module offering engine protection and alarm circuits shall be provided which shall
include:

<table>
<thead>
<tr>
<th>ALARMS NON-URGENT (Visual only)</th>
<th>ALARMS URGENT (Visual + audible + engine shutdown)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selector switch not in auto</td>
<td>Low oil pressure (engine)</td>
</tr>
<tr>
<td>Starter battery charger failed</td>
<td>High temperature (engine)</td>
</tr>
<tr>
<td>Low fuel</td>
<td>Under speed (engine)</td>
</tr>
<tr>
<td>Low cooling water</td>
<td>Over speed (engine)</td>
</tr>
<tr>
<td></td>
<td>Start failure (engine)</td>
</tr>
<tr>
<td></td>
<td>Abnormal output voltage (alternator)</td>
</tr>
<tr>
<td></td>
<td>Reversed power (alternator)</td>
</tr>
<tr>
<td></td>
<td>CB O/C trip (alternator)</td>
</tr>
<tr>
<td></td>
<td>Starting lockout</td>
</tr>
<tr>
<td></td>
<td>High jacket water temperature</td>
</tr>
<tr>
<td></td>
<td>Low lubricating oil pressure</td>
</tr>
<tr>
<td></td>
<td>High lubricating oil pressure</td>
</tr>
<tr>
<td></td>
<td>Fuel oil tank low level.</td>
</tr>
</tbody>
</table>

Operation of each of the protection circuits shall interrupt the fuel cut-off solenoid supply and give a separate visual indication on the module.

The protection circuits shall be reset by a push-button and a further push-button shall be provided for lamp testing of the visual indicators.

The protection and alarm indication circuits shall be operated from the starter battery.

A spare voltage-free single pole changeover contact rated at 5 amps 220 AC shall be provided for each alarm indication. Each contact shall be wired to terminals to enable a remote alarm panel to be installed by others.

**Battery charging module**

One mains-operated battery charger module, complete with ammeter, voltmeter and protection, which shall charge the engine starter battery shall be provided.

The charger shall operate in parallel with the engine-driven generator and shall have self-adjusting, stepless control characteristics (constant voltage, current limiting).

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 signals (contacts or voltage) shall be brought to terminals for connection to an external monitoring system.

The module shall be suitable for connection to the 220 Volt AC mains with a maximum voltage variation of ± 15% and a maximum frequency deviation of ± 3 Hz.

Output voltage shall be kept within 1% of the float charge voltage designed for maximum water conservation and maximum life of the battery.
The ripple content in the output of the charger shall be less than 2%.

The battery charger shall be equipped with the following additional equipment:

Overload protection

One 48 mm x 48 mm dial shielded voltmeter and associated push-button for the indication of battery volts

One 48mm x 48 mm dial shielded type ammeter for the indication of battery charging current.

POWER AND CONTROL SYSTEM

Main low voltage distribution board

The main low voltage distribution board will be supplied and installed by the contractor undertaking the electrical installation for the New data Centre at the National Research Foundation Building at the CSIR complex with the contractor providing the Certificate of Compliance after installation for approval of the NRF Agent/Engineer.

Change over switches/contactors

The automatic change-over switch shall be installed at the new data centre’s distribution board, and not at the generator. A voltage sensing cable is required to the generator to sense the main power state.

Earthing

The electrical sub-contractor will supply and install the necessary earthing for the diesel generator. The supplier shall provide his requirements for the earthing of the diesel generator for the installation.

Control cables

The required control cables between the main low voltage distribution board and the diesel generator will be installed by the electrical sub-contractor.

The NRF Agent/Engineer will co-ordinate the interface and requirements between the supplier of the main low voltage distribution board and the supplier of the diesel generator.

TESTING

General

The complete testing including the provision of test facilities, instruments, dummy loads and switchgear at both the manufacturer’s premises and on site, as well as fuel at both sites shall form part of this Contract.

For both tests at the manufacturer's premises and on site, the NRF Agent/Engineer shall be notified two weeks in advance in order that a representative can be sent to witness these tests.

The test instruments provided shall in all cases be of high quality and suitable to adequately assess the quantities being measured or the equipment being tested. The test equipment remains the property of the Contractor.

Testing at works

The necessary tests to prove compliance with this Specification shall be carried out at the manufacturer’s premises.

These tests shall include, but not necessarily be limited to, the tests detailed below:

- Full load and overload output with all auxiliary equipment attached.
- Cold starting and load acceptance
- Governing for steady and step-loads.
- Fuel consumption
- All relevant pressures, flows, speeds, etc.
- Alternator characteristics including rated full load and overload output, harmonic distortion, regulation under steady and step-loads, voltage transients, recovery times and overshoot, etc.
- Systems operation and fault protection circuits
- Switchgear and instrumentation
- Insulation of alternator, cables and switchboard
- Battery capacity
- All relevant operating temperatures including cooling medium, alternator windings, bearings, exhaust gas.

### Procedures (Works testing)

The set shall be run long enough to satisfactorily determine all the relevant quantities under stabilised conditions.

A varying load test shall be carried out at the manufacturer's premises where the set must be run at various loads from no-load to 10% overload and back to no-load, the following readings being taken at 20% load steps:

- Voltage
- Current
- Power factor (alternatively wattage)
- Frequency

The test sequence is to be carried out at unity power factor and a second test sequence at 0, 85.

It has to be ensured that the machine was stationary for a minimum period of six (6) hours before the test is performed.

The engine water heaters may be supplied from the mains for the purpose of the test.

### Testing at site

The final acceptance tests at site shall include, but not necessarily be limited to, the tests listed below:

- Insulation and continuity of wiring
- Cold starting and load acceptance
- System operation, fault protection circuits and alarm
- Switchgear and instrumentation
- Battery capacity and battery charger

A six (6) hour test. The set shall be subjected to full load for five (5) hours followed by 10% overload for one (1) hour. The following readings shall be taken at 30 minute intervals during the five hour period and at 10 minute intervals under overload:

- Temperature (oil, water and exhaust gas)
- Oil pressure
- Alternator voltage, frequency, power factor or wattage
- Battery voltage and charging current
- Ambient temperature

The alternator and engine shall be inspected after the test.
Test reports
At the completion of all tests, a comprehensive test report including healthy, safety, CO2, ventilation, Certificates of Compliance, exhaust gases and associated emissions, shall be compiled and submitted to the NRF Agent/Engineer in duplicate.

The tests at the manufacturer's premises and the on-site tests shall be shown separately. In addition, the test reports shall be included in the manuals as specified.

INSTALLATION

Handling, hoisting and crane usage
The Contractor shall provide and carry out everything necessary to complete the whole installation and put it into service.

Erection
Before erection commences the equipment shall be inspected and properly cleaned to remove the protective coverings and coatings applied before dispatch.

All coils, instrument windings and relays shall be tested by means of a 500 Volt Megger to ascertain whether any breakdown of insulation has taken place.

All components shall be examined for visible signs of damage and all damage shall be reported in writing to the NRF Agent/Engineer.

The Contractor shall carry out the erection, including cutting holes for holding down bolts, positioning and grouting holding down bolts in accordance with jigs or drawings supplied, observing all erection instructions and precautions for erection that may be issued by the manufacturer's of the equipment.

The Contractor is to make sure that the complete set has been properly aligned and that all bolts and connections and mating parts have been properly assembled.

All bolts and any other fastenings are to be tightened up and all electrical connections checked for tightness.

All wedges and packings installed at manufacturer's works to prevent damage to moving or delicate components during transport are to be removed.

The paintwork is to be touched up with matching paint.

Notices
In the diesel generator enclosure a clearly legible and indelible warning notice must be mounted in a conspicuous position. The notice shall be made of a non-corrodible and non-deteriorating material, preferably plastic, and must read as follows, in red letters on a white background:

DANGER
The engine will start without notice
Turn selector switch on control board to "OFF" before working on the installation

A metal danger plate of 250 mm x 150 mm complete with skull and crossed bones with the following words engraved on the plate shall be supplied and installed on the door:
GEVAAR   DANGER    INGOZI

All other notices as required by the relevant Machinery and Occupational Safety Act, Act, and the relevant regulations of the Factories, Machinery and Building Works Act, as amended, shall be supplied and installed on enclosure doors.

An additional notice or engraved metal plate shall be fitted to the engine to indicate the type, grade and manufacture of the lubricating oils for the engine.

The drawings as mentioned under the clause - "DRAWINGS AND MANUALS" are required.

Tools and loose equipment
A sheet steel cabinet is to be provided containing a set of tools for the service, maintenance and small repairs of the complete installation. All equipment shall be neatly hung in the cabinet for easy identification. The cabinet shall be pad lockable. The NRF Agent/Engineer will verify the list of proposed items prior to the NRF issuing a purchase order to acquire the set of tools.

DRAWINGS AND MANUALS

Drawings submitted for approval
As soon as possible after the contract has been signed with the contracted bidder, the contractor shall, at his expense, submit to the NRF Agent/Engineer for approval three prints of the drawings scheduled below:

- All general arrangement drawings.
- All drawings of the plinth
- All drawings of the site.
- Installation drawings for the exhaust systems.
- Detailed dimensional drawings of all equipments.
- Complete wiring diagrams and block schematic diagrams.
- Dimensioned general arrangement drawing of all equipment on the switchboard.

"As-built" drawings
On completion of the Contract, all drawings required for the manuals shall be pre-prepared and included in the manuals as specified. In addition a set of transparencies shall be handed to the NRF Agent/Engineer to form the "as-built" records. These final drawings shall include the drawings schedules below:

- A proper and accurate as-made wiring diagram of the complete installation showing circuit numbers, terminal strip numbers and conductor colours.
- A schematic diagram clearly showing functions and components of the control equipment and switchgear is to be included.
- Fully dimensioned as-made physical layout drawings of the generating set, substation, cooling and exhaust system.
- Fully dimensioned as-made physical layout of the switchboard.
- A detailed schedule of all wiring.
- The Contract shall be deemed incomplete until all drawings have been received by the NRF Agent/Engineer.
- A print of the drawings under the second and third clauses of this section shall be mounted on the wall of
the low voltage chamber behind a Perspex or glass cover.

- The drawings must be professionally drawn on plastic transparencies with annotations.
- A copy of each wiring- and circuit-diagram shall be supplied mounted in a single glass-fronted timber frame adjacent to the switchboard.

Manuals

Upon completion of the Contract, three complete sets of manuals shall be handed to the NRF Agent/Engineer.

Each handbook shall contain complete information on the following aspects of all units comprising a working installation:

- Technical descriptions and specifications of equipment
- Engine workshop manual
- Erection and commissioning instructions
- Operating instructions
- Description of functioning, adjustment and maintenance of equipment
- Part lists, with illustrations where necessary, for correct identification of components for ordering of replacements.
- The Contract shall be considered incomplete until all drawings and manuals have been received and approved by the NRF Agent/Engineer.
- An additional notice or engraved metal plate shall be fitted to the engine to indicate the type, grade and manufacture of the lubricating oils for the engine.

The drawings as mentioned under the clause - "DRAWINGS AND MANUALS" are required.

GENERATOR OFFERED CHECKLIST TO SPECIFICATION

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Specified</th>
<th>Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>General</td>
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<td></td>
</tr>
<tr>
<td>1.1</td>
<td>Manufacturer</td>
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</tr>
<tr>
<td>1.2</td>
<td>Continuous (prime) power (kVA)</td>
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</tr>
<tr>
<td>1.3</td>
<td>Continuous (prime) power (kW)</td>
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</tr>
<tr>
<td>1.4</td>
<td>Power factor</td>
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<tr>
<td></td>
<td>Standby power (kVA)</td>
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</tr>
<tr>
<td></td>
<td>Standby power (kW)</td>
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<tr>
<td>1.5</td>
<td>Voltage (volts)</td>
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<tr>
<td>1.6</td>
<td>Frequency (Hz)</td>
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<tr>
<td>1.7</td>
<td>Phases</td>
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<td>Neutral</td>
<td>Neutral</td>
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</tr>
<tr>
<td>1.9</td>
<td>Enclosure</td>
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<tr>
<td></td>
<td>&gt;Type</td>
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<tr>
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<tr>
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<td>&gt;Sound attenuation</td>
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</tr>
<tr>
<td></td>
<td>&gt;Sound level</td>
<td>70 dBA at 7 metres</td>
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</tr>
<tr>
<td>2</td>
<td>Engine</td>
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<td></td>
</tr>
<tr>
<td>Item</td>
<td>Description</td>
<td>Specified</td>
<td>Offered</td>
</tr>
<tr>
<td>--------------------</td>
<td>---------------------------------------------------------------</td>
<td>------------</td>
<td>---------</td>
</tr>
<tr>
<td>2.1 Manufacturer</td>
<td>Caterpillar or Perkins or equivalent</td>
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</tr>
<tr>
<td>2.2 Model</td>
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</tr>
<tr>
<td>2.3 Cooling</td>
<td>Water cooled</td>
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<tr>
<td>2.4 RPM</td>
<td>Not Specified</td>
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<tr>
<td>2.5 Speed regulator</td>
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<tr>
<td>2.6 Regulator class</td>
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</tr>
<tr>
<td>2.7 Governor</td>
<td>Electronic</td>
<td></td>
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</tr>
<tr>
<td>2.8 Continuous rated power (kW)</td>
<td>32</td>
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<tr>
<td>2.9 Standby rated power (kW)</td>
<td>36</td>
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<tr>
<td>2.10 Number of cylinders</td>
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<tr>
<td>2.11 Displacement (litre)</td>
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<td>2.12 BMEP (kPa)</td>
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<tr>
<td>2.13 Fan loss (kW)</td>
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<tr>
<td>2.14 Fuel consumption</td>
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<tr>
<td>&gt;25% (l/hour)</td>
<td>l/hour</td>
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<tr>
<td>&gt;50% (l/hour)</td>
<td>l/hour</td>
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<tr>
<td>&gt;75% (l/hour)</td>
<td>l/hour</td>
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<tr>
<td>&gt;100% (l/hour)</td>
<td>l/hour</td>
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<tr>
<td>2.15 Silencer</td>
<td>Stainless steel</td>
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</tr>
<tr>
<td>2.16 Voltage (VDC)</td>
<td>24</td>
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<tr>
<td>2.17 Batteries</td>
<td>Not Specified</td>
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</tr>
<tr>
<td>&gt;Type</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>&gt;Make</td>
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<td>&gt; High engine temperature</td>
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<td>&gt; High engine speed</td>
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UPS

GENERAL
The specification is to cover the complete installation of the Uninterrupted Power Supply (UPS) for the NRF new data centre.

Due to different solutions, modules, and approaches followed by Original Equipment Manufacturers (OEM), solutions that meet the requirements in this document but have slight variations to drawings or layout description are not automatically excluded. It is recommended that the NRF Agent/Engineer is contacted to confirm whether a specific device/solution will be considered before a tender is submitted.

Bidders shall also note that if terminology that is generally attributed to a specific OEM does not exclude other OEMs, as long as the design requirements are met.

The supply, delivery, off-loading, installing, testing, and commissioning of a new UPS installation system with 2 UPSs in a parallel configuration, dedicated to the data centre and its cooling system, including automatic transfer switch, proposed cable routing, and new distribution board for the data centre.

The UPS solution shall be installed in the NRF new data centre. All required building works will be completed by others and falls out of the scope of this tender.

UPS SCOPE OF WORK
The uninterruptable power supply (UPS) installation scope of work comprises of the following:

a. The supply, delivery, off-loading, installing, testing= and commissioning of a new UPS installation system with two online, double-conversion UPSs installed in a parallel configuration, dedicated to the data centre and its cooling system with a total expected maximum load of 40 kVA.

b. Each UPS shall comply with the following (more detailed specifications are provided in the generator specification section of this document):
   - Continuous power 40 kVA
   - Power Factor 0.9
   - Voltage 400 volts
   - Phases 3

c. Each UPS is to be provided with a 18 kW.h battery and battery charger installation. The system shall allow for an additional 54 kW.h, in 18 kW.h increments, batteries to be installed for each UPS in future. The battery charger shall be sufficient for t full 72 kW.h battery installation at each UPS.

d. The outputs of the two UPSs shall be fed into two separate DB sections. The load will be distributed evenly between the UPSs during normal operation. The distribution of the loads will be managed by the equipment (dual supply equipment) and falls outside of the scope of this project.

e. Each UPS shall be provided with a static transfer switch and a maintenance bypass switch.

f. All equipment including, but not limited to the UPS modules, batteries, control module, etc. shall be provided with a floor standing cabinet.

g. The UPS installation is to be connected by a modbus connection to the building’s existing BMS installation. The configuration and integration of the UPS controller(s) to the system will be done by others. The installer of the generator shall ensure the device software is up to date, provide adequate sleeves, and install modbus cables to the system.
The UPS installation is to be supplied with its own GSM module (with a 6 year SMS contract). The GSM module will alert the selected personnel of all UPS-related events including loss of main power and alarms.

UPS SPECIFICATION

Definitions

- **Rectifier** shall denote that portion of the converter module containing the equipment and controls to convert the incoming AC power to regulated DC power required by the inverter.
- **Inverter** shall denote that part that converts the DC supplied by the rectifier to AC satisfying the load requirements.
- **Battery charger** shall denote that portion of the power converter module containing the equipment and controls to convert the incoming AC power to precisely regulated DC power required for battery charging.
- **Critical load** denotes the load as presented to the UPS by the computer or other load requiring constant supply and associated circuits and apparatus.
- **Mean-Time-Between-Failure (MTBF)** shall denote an overall MTBF of the UPS as a complete system.
- **A system failure** shall denote any interruption to, or degradation of the critical load bus voltage or frequency beyond the limits set forth herein.
- **Efficiency** shall denote the ratio of real output power (kW) to real input power (kW) with the UPS operating at a defined load power at the defined power factor, the battery fully charged and with nominal input voltage.

System Requirements

Input to the UPS

a. Input voltage : 400/231V ± 5%
b. Frequency  : 50Hz ± 4%
c. System : 3 phase 4 wire with operative earth conductor, supplied from standby generator (change-over switch) set that forms part of this tender.
d. Power factor  : Not less than 0,8 lagging.
e. Max starting current: 10 times full load current for not more than ½ a cycle with rectifier soft starting facility.

Output to Load

a. Rating : 40 kVA (for each UPS).
b. Output voltage : 400V 3-phase
c. Frequency : 50 Hz ± 0,5 Hz.
d. System : 3 phase 4 wire with operative earth conductor.
e. Voltage regulator : ± 10% maximum deviation of steady state voltage recovering to within 5% in less than 50 ms and to within 1% less in that 100 ms.
f. Frequency stability : Normally automatically synchronised to mains frequency if the latter is within 50 Hz ± 2% (adjustable window) Runs free at 50 Hz ± 0,5 Hz at any load when mains is out of limits.
g. Harmonic content : Less than 4% total distortion.
h. Amplitude modulation : Less than 2%
**Overall Performance**

Efficiency (overall) : Minimum of 85% (25% load), 90% (100% load)

**System Description**

The system shall consist of two static UPS units complete with the following components (each):

a. Rectifier/charger.
b. Inverter.
c. Battery installation.
d. Automatic electronic no-break bypass circuit and switch.
e. Separate manual bypass switch.
f. Protective devices and measuring equipment.
g. The required controls and necessary equipment including GSM and modbus capabilities.
h. A self monitoring system with digital readout by means of which all critical functions can be checked.

The system shall be capable of providing an uninterrupted supply to the load by means of a 18 kW.h battery backup installed for each of the UPSs.

The complete system, including all controls shall be designed in such a way that the failure of any one vital central component will **NOT** cause a complete system failure. If necessary such a failure must be avoided by connecting the load directly to the mains by means of the bypass switch.

The UPS shall operate satisfactorily synchronous with the mains supply even under severe conditions of up to 100% unbalanced load.

The UPS shall be rated to carry the stated full load current. The UPS shall furthermore be capable of withstanding the following overloads.

**Static Overloads:**

a. 100% of full load continuously.
   i. 125% of full load for 5 minutes.
   ii. 150% of full load for 2 minutes.
   iii. 165% of full load for 1 second with inductive decay after initial equipment switch on surge current.

b. **Dynamic Overload** :
   i. 300% for less than 5 msec.
   ii. 1000% for less than 1 msec.

All component parts, cables and other connections shall be amply rated to withstand the overloads stated and maintain the input voltage **at the load** within the tolerances stated.

The equipment shall be designed for the maximum operating efficiency. The efficiency shall be determined when the system is delivering full load at 0,8 power factor with the batteries fully charged. The load required by the auxiliary equipment (controls, alarms, etc), electronic switches and cabinet fan shall be included in he determination of overall efficiency. A typical test report clearly showing how the efficiencies are calculated, shall be submitted with the tender.
It shall be the responsibility of the successful Bidder to ensure satisfactory operation of the complete system for the load to be supplied. It is, therefore, essential that the Bidder acquaint himself fully with typical load conditions before the tender closing date.

All cabinets containing thyristors shall be adequately screened and earthed to prevent direct radio frequency radiation.

Bidders shall submit with their bids a schematic diagram showing:

- Input circuit breakers.
- System busbars.
- Rectifiers.
- Batteries.
- Inverters.
- Electronic switches.
- Bypass circuit.
- Detour circuit.
- Fuse protection.
- Output circuit breakers.
- Oscillator.
- Power supply circuits to oscillator, alarms, controls, etc.
- Battery isolator.

**Inverter Oscillator**

The inverter shall contain an oscillator capable of operating and maintaining the inverter output frequency as specified. The inverter oscillator shall be capable of frequency synchronisation and phase locking to the mains (or standby generator) power source frequency. When operating as a slave to the mains or standby power and a failure occurs in the slaving signal, the inverter oscillator shall automatically revert to a free running state and maintain the specified limits. All changes in output frequency to free run or synchronise shall be gradual to suit the load requirements.

**Rectifier**

The UPS shall have its own rectifier and rectifier transformer which shall operate satisfactorily from the mains or standby supply.

The rectifier shall be of the solid state type providing full wave rectification of the input voltage suitably regulated to suit the input requirements of the inverter. Where necessary, a high grade DC filter shall be utilised to limit the output ripple to within acceptable levels for the inverter input. Current limiting features shall be provided to protect the rectifier. The current limiting settings shall be variable for final adjustment on site.

Voltage free contacts shall be provided for the malfunction alarms of the rectifier.

An input monitoring circuit shall be provided for the rectifier. This circuit shall switch off the rectifier when the r.m.s. value or frequency of the input voltage falls below present values.

The necessary protection circuitry shall be provided to switch off the rectifier if any one of the rectifier phases should fail, thus presenting an unbalanced load to the incoming supply.
The output of the rectifier shall be connected in parallel to the battery and inverter.

The rectifier shall have over temperature protection. Temperature sensing probes shall be placed on the thyristor housing, thyristor mounting, or on the heat sink close to the thyristor. The sensing of the off coming air temperature alone is not acceptable.

Bidders shall take into account the possible effects of harmonics that may be present on the input supply due to non-sinusoidal waveforms at the rectifier input, phase commutation, the effect of reactance during phase commutation etc. The input voltage monitoring circuits of the rectifiers shall be adequately filtered and buffered to ensure reliable load control and to prevent continuous on-off switching of the rectifiers.

**Inverter**

The inverter shall be adequately protected against any excessive overload or short circuits that occur in the load. Reactive current limiting or other methods shall be employed to render the thyristors short circuit proof. The successful Bidder shall replace any thyristors or any inverter components at his own expense if these should be damaged.

The necessary feedback and control circuits shall be incorporated to ensure satisfactory operation separately or in synchronisation with the mains supply under all conditions of dynamic load variations, stated overloads, severe unbalanced conditions and high operating temperatures. The thyristor bridge shall contain the necessary auxiliary circuitry to ensure satisfactory operation.

The output of the inverter shall be connected in parallel with the thyristor switch output.

Each inverter shall have over temperature protection similar to the over temperature protection for the rectifier.

A discharge device shall be provided across the D.C. input to the inverter, which will discharge any capacitors in the inverter module when it is switched off.

**Battery charger**

The battery charger shall be a solid state, constant voltage type providing full wave rectification of the input voltage with the output regulated to an accuracy as specified. A high grade D.C. filter shall be utilised to limit the output ripple to the stated tolerance. Current limiting features shall be provided. The value of the current limit setting, shall be in accordance with the maximum allowable charging current that the batteries can withstand.

The maintained voltage on float charge shall be such as to give maximum life to the batteries whilst maintaining the maximum charge conservation and minimising gas formation and water loss. The optimum float charge voltage shall be specified by the battery manufacturer but is expected to be approximately 2.23 volts per cell. The voltage shall be kept within ± 0.5% of the nominal value for all loads from no load to the full rated battery charger current when supplying the full output with batteries discharged.

The battery chargers shall be capable of charging 72 kW.h batteries, expected to be installed in future, for each UPS.

**Battery**

The battery capacity shall be sufficient to provide full load for the specified time. The capacity shall be rated at a
maximum specific gravity of 1,245 at 25 °C and correctly filled.

Bidders shall state the discharge capacity of the battery after 10 hours of charge and the battery voltage at its terminals under various conditions. The inverter shall switch off on low battery voltage.

The battery cells shall be of the maintenance free type.

The batteries shall give satisfactory service for a minimum period of 3 years. Bidders shall state the maximum expected lifetime of the batteries and motivate their statement, and provide a statement by the battery manufacturer supporting this and stating that the charger offered is suitable for the battery.

The batteries shall be complete with cell inter-connectors and row inter-connectors. The output terminals shall be robust and adequately dimensioned for the output cable terminations.

The inter-connectors between cells and shall be made in a manner giving the lowest volt drop and maximum resistance to corrosion.

All connections to cells must consist of flexible cable to avoid mechanical stress at the cell terminals.

The Bidder shall describe the method of removal and replacement of a faulty cell.

The battery shall be complete with a battery fuse isolator capable of breaking the full load current drawn by the inverter. These battery fuse isolators shall be installed in the inverter unit room or cabinet.

Terminal posts should be effective for the expected lifetime of the battery and should be effective even if the cell is overfilled.

The battery may be resistance grounded through 5000 ohm to 10000 ohm for the purpose of ground fault.

Bidders shall submit full details with dimensioned drawings of the batteries offered.

Bidders shall submit the calculations and motivations complete with curves supporting the selection of a specific battery cell.

All cabling for the battery shall be installed on PVC cable trays and fitted to the satisfaction of the NRF Agent/Engineer.

**Automatic by-pass switch**

An integral automatic bypass switch shall be provided to transfer the critical load without break to the mains should the UPS unit fail. The latter unit shall simultaneously be disconnected from the critical load bus. This transfer shall, however, be inhibited if the mains is out of synchronism with the UPS output. Retransfer to the UPS output shall be on a manual or automatic command. This switch must have a cover fitted screwed to the panel so as to make the operating of this switch impossible without having first removed the cover. This switch cover must also have the following words etched in white with a red background mounted on or adjacent the cover: **CAUTION : BYPASS SWITCH ONLY : ONLY TO BE OPERATED BY QUALIFIED PERSONNEL**

The static switch should prevent “hunting” and after trying unsuccessfully to switch a maximum of three times the static switch should be inhibited from further switching.

**CONSTRUCTION OF CUBICLES AND SWITCHBOARDS**

All the converter equipment shall be housed in totally enclosed, free standing, floor mounted cubicles, designed to provide adequate ventilation for the equipment.
All cubicles shall be rigid with suitably braced doors providing front access.

All cubicles shall be vermin proof.

All equipment shall be mounted on the metal framework suitably arranged to provide safe operation and ease of access. Fuses and switchgear in particular should be safely accessible even under load conditions.

All power bridges, filters and other major components both in the inverter and rectifier, shall be completely withdrawable to facilitate rapid repair and/or replacement. The method of withdrawal shall be such that a complete module can be extracted in the operating condition so that checks and measurements may be made while in operation and access to all components facilitated.

All electronic printed circuit cards shall be of a good quality and shall be easy and simple to interchange.

All auxiliary power supplies shall be duplicated and shall be connected so as to operate in parallel redundancy. At least two primary sources of power shall be provided for each of the power supplies in the system.

Flexible wires shall not be soldered directly onto terminals but shall have a crimped tab, which is soldered onto a terminal or post. The wire wrapping technique shall be employed for electronic circuits where possible.

The front panel alarms shall be clearly and adequately marked in both official languages. A single line mimic layout of the switchgear shall be provided on the front of the cubicles providing a graphic display of the circuitry of the equipment involved.

All input and output power cables shall be terminated using approved cable glands, onto a cable gland support bracket. The cable conductors shall terminate at the connecting busbars or shall be connected directly to the appropriate switchgear. All power cables shall be properly numbered with wrap around cable markers with punched figures to identify cables at each termination point.

INSTRUMENTATION AND CONTROLS

All the required instrumentation as indicated on the drawings shall be provided.

Supply and install all the necessary controls for the operation of the system. Facilities shall be provided for controlling the rectifier, switching the inverter on, switching the inverter output to the synchronous motor/alternator and controlling the bypass thyristor switch circuit.

All control switching of the rectifier and inverter as well as the bypass operation shall be pushbutton initiated.

Standard electronic equipment from overseas manufactures shall not be accepted if not duly protected with transsors and metal oxide varistors in power supplies and external communication lines. Standard electronic equipment not internally protected with transsors or MOV’s may be protected externally by means of transsors and MOV’s mounted on klippon type terminals. All external communication and remote power supply lines shall be protected by means of transsors and MOV’s of sufficient rating mounted on klippon type terminals.

ALARMS

All alarms shall be of the tell tale type with memory features e.g. a flashing light indicates a fault coupled with an audible alarm. The pressing of the appropriate button shall cancel the audible alarm and allow the alarm lamp to burn continuously until the fault is removed.

The following minimum alarm conditions shall be monitored on the equipment:
• Normal
• Mains failure
• Inverter failure
• Shutdown imminent
• Load on mains
• Overload
• Charger fails

Where required a remote panel must be supplied and installed. The alarms indicated must duplicate all the alarms indicated on the UPS control panel. In addition a buzzer must be provided. Any alarm occurring must sound the buzzer to draw attention. An alarm accept pushbutton to silence the buzzer must be provided.

Provision shall be made on all the alarms mentioned above to be remotely monitored. Normally open contacts shall be supplied at the converter for each alarm for this purpose. The contacts shall close under an alarm condition.

VENTILATION

All equipment racks shall be positioned in logical fashion on the floor in a configuration, which will ensure proper ventilation

Each cubicle containing heat-generating equipment (thyristors, transformers electronic circuitry, filters, etc) shall, where necessary, have extraction ventilation fans mounted on the top of the cubicle to assist air circulation. These fans shall be fed from the output distribution panel of the uninterrupted power supply.

QUALITY ASSURANCE

The contractor shall be responsible for the performance as specified herein and to prove such performances to the satisfaction of the NRF Agent/Engineer. Except as otherwise specified, the contractor must utilise facilities acceptable to the NRF Agent/Engineer.

DRAWINGS

As soon as possible after the awarding of the contract, the successful Bidder shall at his expense submit to the NRF Agent/Engineer for approval, three prints of:

(1) All general arrangement drawings.
(2) Detailed dimensioned drawings of all plant and equipment.
(3) Complete wiring diagrams and block schematic diagrams.

At the same time a list of all equipment designations, labels, and so forth, in English shall be submitted for approval.

The approval of drawings shall not relieve the successful Bidder of his liability to carry out work in accordance with the terms of the contract.

On completion of the contract, a complete set of transparencies of all drawings of a quality acceptable to the NRF Agent/Engineer shall be handed to the NRF Agent/Engineer at the expense of the successful Bidder. These final drawings shall include:

(1) A proper and accurate as-made wiring diagram of the complete installation showing circuit
numbers, terminal strip numbers and conductor colours.

(2) A schematic diagram clearly showing functions and component values. A material list showing make, model and characteristics of all components of the control equipment and switchgear is to be included.

(3) Fully dimensioned as-made physical layout drawing of the equipment, batteries and ventilation equipment.

(4) A detailed **schedule** of all wiring.

The contract shall be deemed incomplete until all drawings have been received by the client.

**INSTRUCTION OF OPERATOR AND MANUALS**

After completion of the installation, and when the plant is in running order, the successful Bidder will be required to instruct an attendant in the operation of the plant, until he is fully conversant with the equipment and handling thereof.

Three (3) copies of maintenance, fault-localising and operating manuals together with the drawings required shall be handed over to the NRF Agent/Engineer.

**TESTS**

The complete testing including the provision of test facilities, instruments, dummy loads and switchgear at the manufacturer's premises in the Republic of South Africa shall form part of this contract.

For the test in the manufacturer's premises the NRF shall be notified four weeks in advance in order that a the NRF Agent/Engineer can be sent to witness these tests.

**Battery tests**

1. The output voltage of the battery unit (i.e. all the cells making up one battery) shall be tested with the incoming supply removed.

2. The full rated load for the battery shall then be connected to it. The voltage shall be measured at 5 minute intervals for the duration discharge period.

3. The batteries shall be left to recharge. The voltage shall be checked after 14 hours with the load and incoming supply removed as well as with the load connected but incoming supply removed.

4. When fully recharged, the voltage and specific gravity of every cell shall be measured with the incoming supply removed.

5. The circulating A.C. current through and the A.C. voltage across the batteries shall be measured when the rectifiers are on with the battery discharged and fully charged.

**Oscillator tests**

1. Frequency within tolerances at all loads.
(2) Parallel redundancy.

(3) Auto automatic synchronisation for connection of the synchronous motor/alternator to mains via the thyristor switch.

An electronic frequency counter shall be used to measure the frequency.

Rectifier tests

(1) Output voltage of rectifiers at no load and full load with batteries charged and not charged.

(2) Current limit, both for mains failure and return to mains.

(3) Switch off value mains input monitor.

(4) Sequential switch on for return to mains.

(5) Soft start circuits.

General

Ammeters will not be acceptable to prove the above items. A wave analyser and a recording oscilloscope will be required. Photographs shall be taken of the oscillograms by the contractor in the presence of the NRF Agent/Engineer.

The overall efficiency of the complete uninterrupted power supply shall be proved to be within the specified limit at full load and at no load.

The overcurrent protection mechanisms of the A.C.B. shall be proved by current injection (either primary or secondary)

The bypass and detour circuits shall be proved.

All alarms, indications and control functions shall be proved.

The test instruments provided shall in all cases be of high quality and suitable to be able to adequately assess the quantities being measured and the equipment being tested. All instruments shall be calibrated by a testing laboratory approved by the National Calibration Service of the CSIR. The test equipment remains the property of the successful Bidder.

At the completion of the tests, a full test report shall be submitted by the contractor to the NRF Agent/Engineer in triplicate.

Continuously adjustable dummy loads of a rating suitable to comprehensively test the UPS shall be provided by the contractor as well as any temporary cables required for the connection of the dummy load to the UPS on site.

CABINET

The contractor shall supply and install a metal cabinet with lockable doors of sufficient size to house all operating and maintenance instructions, drawings, spares, tools, etc.

SCHEMATIC DIAGRAM

A schematic diagram of the complete system shall be mounted in a suitable place and shall be resin encapsulated.
AUXILIARY EQUIPMENT
Bidders shall make all allowances for plant required (i.e. hoists, cranes, trolleys, etc.) ensuring positioning of the equipment in the UPS room.

Guarantee
The Contractor shall guarantee the complete plant for a period of five years after first delivery has taken place.
If during this period the plant is not in working order, or not working satisfactorily owing to faulty material, design or workmanship, the Contractor will be notified and immediate steps shall be taken by him to rectify the defects and/or replace the affected parts on site at his own expense.

MATERIALS AND WORKMANSHIP
a. The work throughout shall be executed to the entire satisfaction of the NRF Agent/Engineer who shall interpret the meaning of the Contract Document and shall have the authority to reject any work and materials, which, in his judgement, are not in full accordance therewith. All condemned material and workmanship shall be replaced or rectified as directed and approved by the NRF Agent/Engineer.
b. All work shall be executed by qualified tradesman.
c. The Contractor shall warrant that the materials and workmanship shall be of the highest grade, that the equipment shall be installed in a practical manner in accordance with the best practices and ready and complete for full operation. It is specifically intended that all material or labour which is usually provided as part of such equipment as is called for and which is necessary for its proper completion and operation shall be provided without additional cost whether or not shown or described in the Contract Document.
d. The Contractor shall thoroughly acquaint himself with the work involved and shall verify on site all measurements necessary for proper installation work. The Contractor shall also be prepared to promptly furnish any information relating to his own work as may be necessary for the proper installation work and shall co-operate with and co-ordinate the work of others as may be applicable.
e. All components and their respective adjustment, which do not form part of the equipment installation work, but influence the optimum and safe operation of the equipment shall be considered to form part of, and shall be included in the Contractor’s scope of works.
f. All control equipment and serviceable items shall be installed and positioned such that they will be accessible and maintainable.
g. The Contractor shall make sure that all safety regulations and measures are applied and enforced during the installation and guarantee periods to ensure the safety of the public and the User Client.
h. The Contractor is to include for all scaffolding required to complete the work required.

Brochures
Detailed brochures of all equipment offered shall be presented together with the tender documents.
OPERATING INSTRUCTIONS AND MAINTENANCE

The contractor provides the details of the availability of spares held in South Africa for the engine, alternator, UPS, batteries offered.

Operating Instructions Clarity and Effectiveness

After completion of the installation, the NRF Agent/Engineer verifies the contractor’s operating instructions manages the operating of the equipment, operation and the handling thereof.

Maintenance period

The Contractor will be required to maintain the data centre in accordance with the performance levels in the performance after the back-up power system has been commissioned and taken over by the NRF for the duration of this contract.

OEM Maintenance Schedules

The Contractor shall provide for each component of the installation the Original Manufacturer’s maintenance schedules for carrying out of the maintenance and the contractor’s consolidated preventative maintenance program inclusive of these requirements.

Maintenance Program for the five years

The Contractor shall establish a maintenance program stating the minimum of:

- The consolidated preventative maintenance program inclusive of the OEM maintenance schedules;
- The monthly 1 hour test of the back-up power system starting and taking over the power supply to the data centre upon loss of mains power supply) by a qualified member of his staff;
- Work being performed in the 3 x preventative services at the end of each 4 month segment;
- Work being performed in the annual major service;
- For each maintenance service, the labour time, the consumables, and set replacement parts where these need to be replaced using the OEM schedules

During this visits the contractor’s qualified member of his staff who shall include as a minimum: -

a. Check the mechanical soundness of all parts
b. Check and adjust all the output and control values of the system (voltage, frequency, control voltages, etc.)
c. Take control measurements on the major system components and record these measurements.
d. Replace all defective components.
e. Service batteries.
f. Check ventilation UPS equipment.
g. Clean all equipment and/or rooms as required.
h. Provide 24 hour standby maintenance and repair service at all times, including statutory holidays.

Performance Management of the Maintenance Program

NRF employees with the Contractor manage the performance of the maintenance service against the agreed maintenance program with the measurement as set out in the performance section of this document.

At each visit, arranged in advance with the NRF ICT and NRF Building Maintenance, a record of maintenance
carried out shall be kept. The time and date of visits shall be entered in a logbook, which shall be kept in the DATA Centre or as agreed by all parties.

The preventative maintenance program will be signed by all parties.

**DOCUMENT PACKAGE PROVING ABILITY TO IMPLEMENT THIS CONTRACT**

1. CVs of Key Supply and Install Works Personnel (manager, design, technician personnel) maintenance experience to keep this installation running with minimum of 3 years’ relevant experience, relevant qualifications, and completed 3 or more projects of similar scope in the last 10 years. CVs of the key personnel were complete. stating Role and position - Works Experience - Qualifications and registrations applicable to this contract
2. CVs of Key Maintenance Personnel (manager, design, technician personnel) maintenance experience to keep this installation running with minimum of 3 years’ relevant experience, relevant qualifications, and completed 3 or more projects of similar scope in the last 10 years. CVs of the key personnel were complete. stating Role and position - Works Experience - Qualifications and registrations applicable to this contract
3. Preliminary Project Plan
4. Preliminary Health and Safety Plan
5. List of supply and installation experience with minimum of 3 or more projects completed in the last 10 years where supply and installation on similar scope were completed for all works areas (UPS and Generator experience does not necessarily need to be taken on the same project) in the format of similar completed contracts awarded to him and those currently being undertaken: Employer Consulting Engineer Nature of Work Value of Work (R) -Date Completed
6. List of maintenance experience with a minimum of 3 or more projects completed in the last 10 years where maintenance work on similar scope were completed for all works areas (UPS and Generator experience does not necessarily need to be taken on the same project) in the format of similar completed contracts awarded to him and those currently being undertaken: Employer Nature of Maintenance Work Value of Work (R) -Date Completed
7. Attendance of the briefing and site visit per format below
8. Detail and attach datasheets the equipment that is offered by the contractor including the minimum of the footprint and clearances required by the equipment offered including the cabinet or racks in which the equipment will be installed.
9. Contractor’s Certificate of Registration with CIDB

**SITE BRIEFING ATTENDANCE CERTIFICATE**

This is to certify that I/we, .................................................................
of ..............................................................................................................................
telephone number .................................................................
email address ..............................................................................................................................
on (date) ..............................................................................................................................
have examined the Site of the Works and its surroundings for which I/we am/are submitting this Bid and have, so far as is practicable, familiarized myself/ourselves with all the information, risks, contingencies and other circumstances which may influence or affect my/our Tender.

SIGNED ON BEHALF OF THE BIDDER: ..............................................................
SIGNED ON BEHALF OF THE NRF: ..............................................................

DRAWINGS

LINE DIAGRAMS – See the next two pages
<table>
<thead>
<tr>
<th>Legislative/Technical Documents</th>
<th>Compliance</th>
<th>Reference to Bidder’s document</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bid Section</strong></td>
<td>Submitted</td>
<td>Reference</td>
</tr>
<tr>
<td><strong>(M – Mandatory); (O – Optional)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bidder Eligibility</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procurement Invitation (SBD 1), signed and completed.</td>
<td>M</td>
<td>❑ Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>❑ No</td>
</tr>
<tr>
<td>Declaration of Interest with Government (SBD 4), signed and completed.</td>
<td>M</td>
<td>❑ Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>❑ No</td>
</tr>
<tr>
<td>Preference Points Claimed (SBD 6.1), signed and completed with an original BBBEE certificate or a certified copy of an original BBBEE certificate.</td>
<td>M</td>
<td>❑ Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>❑ No</td>
</tr>
<tr>
<td>Declaration of Past SCM Practices (SBD 8), signed and completed.</td>
<td>M</td>
<td>❑ Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>❑ No</td>
</tr>
<tr>
<td>Certificate of Independent Bid Determination (SBD 9), signed and completed.</td>
<td>M</td>
<td>❑ Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>❑ No</td>
</tr>
<tr>
<td>CSD Report reflecting legal details, registration numbers, details of directors, and tax status</td>
<td>M</td>
<td>❑ Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>❑ No</td>
</tr>
<tr>
<td>Site meeting attendance certificate</td>
<td>M</td>
<td>❑ Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>❑ No</td>
</tr>
<tr>
<td>Certificate of Insurance Cover</td>
<td>M</td>
<td>❑ Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>❑ No</td>
</tr>
<tr>
<td>Form of intent to provide a performance guarantee where deposit required</td>
<td>M</td>
<td>❑ Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>❑ No</td>
</tr>
<tr>
<td><strong>Specification Eligibility</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Document Pack including information and Datasheets of Equipment Offered demonstrating ability to execute this contract</td>
<td>M</td>
<td>❑ Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>❑ No</td>
</tr>
<tr>
<td>Preliminary project plan</td>
<td>M</td>
<td>❑ Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>❑ No</td>
</tr>
<tr>
<td>Three (3) written references for the supply and install of back up electrical plant with contact details for those customers for whom the bidder has completed work within the last sixty months (preferably last thirty-six months) that</td>
<td>M</td>
<td>❑ Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>❑ No</td>
</tr>
</tbody>
</table>

*Note: All references to page numbers are indicative and may not correspond exactly with the actual document.*
<table>
<thead>
<tr>
<th><strong>M – Mandatory; (O – Optional)</strong></th>
<th>Submitted</th>
<th>Bid Section</th>
<th>Reference to Bidder’s document</th>
</tr>
</thead>
</table>

meets the minimum threshold of “Meets requirements.”

Reference 1: From:

Reference 2: From:

Reference 3: From:

Three (3) written references for providing maintenance services to backup electrical plant with contact details for those customers for whom the bidder has completed work within the last sixty months (preferably last thirty-six months) that meets the minimum threshold of “Meets requirements.”

Reference 1: From:

Reference 2: From:

Reference 3: From:

<table>
<thead>
<tr>
<th><strong>Pricing Documents</strong></th>
<th>Compliance</th>
</tr>
</thead>
</table>

Pricing (SBD 3) in this document completed.

M  Yes  No  Page 81

### PRE-QUALIFICATION ELIGIBILITY CRITERIA

**ECONOMIC EMPOWERMENT AS SPECIAL CONDITION OF CONTRACT**

<table>
<thead>
<tr>
<th>Pre-Qualifying Criteria</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A minimum B-BBEE status level</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>An exempted micro enterprise (EME) or qualifying small enterprise (QSE)</td>
<td>EME/QSE INCLUDED IN THE LEVEL SET ABOVE</td>
<td></td>
</tr>
<tr>
<td>At least 51% owned by black people</td>
<td>Not Applicable</td>
<td></td>
</tr>
<tr>
<td>At least 51% owned by black people</td>
<td>Not Applicable</td>
<td></td>
</tr>
</tbody>
</table>

A bidder failing to meet any of the stipulated pre-qualifying criteria is automatically disqualified.
## ELIGIBILITY CRITERIA

<table>
<thead>
<tr>
<th>Selection Element</th>
<th>Meet Specification Minimum</th>
<th>Bid Section Reference</th>
<th>Reference to Bidder's document</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bidder Eligibility Administration</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Procurement Invitation (SBD 1), signed and completed.</td>
<td>❑ YES ❑ NO</td>
<td>Page 3 and 10</td>
<td></td>
</tr>
<tr>
<td>2 Declaration of Interest with Government (SBD 4), signed and completed.</td>
<td>❑ YES ❑ NO</td>
<td>Page 73</td>
<td></td>
</tr>
<tr>
<td>3 Preference Points Claimed (SBD 6.1), signed and completed with an original BBBEE certificate or a certified copy of an original BBBEE certificate.</td>
<td>❑ YES ❑ NO</td>
<td>Page 75</td>
<td></td>
</tr>
<tr>
<td>4 Declaration of Past SCM Practices (SBD 8), signed and completed.</td>
<td>❑ YES ❑ NO</td>
<td>Page 78</td>
<td></td>
</tr>
<tr>
<td>5 Certificate of Independent Bid Determination (SBD 9), signed and completed.</td>
<td>❑ YES ❑ NO</td>
<td>Page 79</td>
<td></td>
</tr>
<tr>
<td>6 CSD Report reflecting legal details, registration numbers, details of directors shareholding, and tax status</td>
<td>❑ YES ❑ NO</td>
<td>Page 7</td>
<td></td>
</tr>
<tr>
<td>7 Site meeting attendance certificate</td>
<td>❑ YES ❑ NO</td>
<td>Page 4 BRIEFING</td>
<td></td>
</tr>
<tr>
<td>8 Certificate of Insurance Cover</td>
<td>❑ YES ❑ NO</td>
<td>Page 69</td>
<td></td>
</tr>
<tr>
<td>9 Form of intent to provide a performance guarantee where deposit required</td>
<td>❑ YES ❑ NO</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td><strong>Evaluation of technical specification o</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 Specifications of equipment offered meet the minimum specification in this document (The NRF Agent/Engineer provides technical clearance of this to the BEC)</td>
<td>❑ YES ❑ NO</td>
<td>Page 11 DETAILED SPECIFICATIO Page 52 DOCUMENT PACKAGE</td>
<td></td>
</tr>
<tr>
<td>11 Maintenance service meets specification (The NRF Agent/Engineer provides technical clearance of this to the BEC)</td>
<td>❑ YES ❑ NO</td>
<td>Page 52 DOCUMENT PACKAGE</td>
<td></td>
</tr>
<tr>
<td>12 All key maintenance personnel (manager, technician personnel) have relevant qualifications and experience meeting specification</td>
<td>❑ YES ❑ NO</td>
<td>Page 11 DETAILED SPECIFICATIO Page 52 DOCUMENT PACKAGE</td>
<td></td>
</tr>
<tr>
<td>Selection Element</td>
<td>Meet Specification</td>
<td>Bid Section Reference</td>
<td>Reference to Bidder’s document</td>
</tr>
<tr>
<td>-------------------</td>
<td>--------------------</td>
<td>-----------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>12 All key Supply and Install personnel (manager, technician personnel) have relevant qualifications and experience meeting specification</td>
<td>❑ YES ❑ NO</td>
<td>Page 11</td>
<td>DETAILED SPECIFICATION Page 52 DOCUMENT PACKAGE</td>
</tr>
<tr>
<td>13 Project plan is complete with all high-level activities identified, phasing and lead times realistic and incorporated, and key activities clearly identified and meets the specification</td>
<td>❑ YES ❑ NO</td>
<td>Page 12</td>
<td>Preliminary project plan Page 52 DOCUMENT PACKAGE</td>
</tr>
<tr>
<td>14 The bidder provided proof of 3 or more projects completed in the last 10 years where maintenance on similar scope were completed for all works areas (UPS and Generator experience does not necessarily need to be taken on the same project)</td>
<td>❑ YES ❑ NO</td>
<td>Page 52</td>
<td>DOCUMENT PACKAGE</td>
</tr>
<tr>
<td>15 The bidder provided proof of 3 or more projects completed in the last 10 years where supply and install of backup plant on similar scope were completed for all works areas (UPS and Generator experience does not necessarily need to be taken on the same project)</td>
<td>❑ YES ❑ NO</td>
<td>Page 52</td>
<td>DOCUMENT PACKAGE</td>
</tr>
</tbody>
</table>

**SBD 3: PRICING CONDITIONS AND DETAIL**

1 **PRICING ASSUMPTIONS AND NOTES**

**Description of items in the schedule**

The short descriptions of the items in the Bill of Quantities are for identification purposes only and together with the relevant clauses of the Project Specification and directives on the drawings determines what ancillary or associated work and activities are included in the rates for the operations specified.

**Quantities reflected in the schedule**

The quantities given in the Bill of Quantities are estimates only, and subject to **re-measuring** during the execution of the work.

**Determining Actual Quantities during the contract**

The Contractor shall obtain the NRF Agent/Engineer’s detailed instructions for all work before ordering any materials or executing work or making arrangements for it.

The Works as finally completed in accordance with the Contract shall be measured and paid for as specified in...
SBD 3: PRICING CONDITIONS AND DETAIL

the Bill of Quantities and in accordance with the General and Special Conditions of Contract, and Particular Specifications and the Drawings.

The validity of the contract will in no way be affected by differences between the quantities in the Bill of Quantities and the quantities finally certified for payment.

Provisional sums

The NRF reserves the right, during the execution of the works, to adjust the stated amounts upwards or downwards according to the work actually done under the item, or the item may be omitted altogether, without affecting the validity of the Contract. The Bidder shall not under any circumstances whatsoever delete or amend any of the sums inserted in the “Amount” column of the Bill of Quantities and in the Summary of the Bill of Quantities unless ordered or authorized in writing by the Employer before closure of tenders. Unauthorized changes made by the Bidder will lead to the disqualification of the Bidder.

Pricing of the bill of quantities

All prices shall be tendered in South African Rands.

The prices and rates to be inserted by the Bidder in the Bill of Quantities shall be the full inclusive prices to be paid by the NRF for the work described under the several items, and shall include full compensation for all costs and expenses that may be required in and for the completion and during the defects liability period of all the work described. This shall include all overheads, profits, incidentals and the cost of all general risks, liabilities and obligations.

Each item shall be priced and extended to the Total column by the Bidder, with the exception of the items for which only rates are required, or items which already have Prime Cost or Provisional Sums affixed thereto. If the Bidder omits to price any items in the Bill of Quantities, then these items will be considered to have a nil rate or price.

All items for which terminology such as “inclusive” or “not applicable” have been added by the Bidder will be regarded as having a nil rate which shall be valid irrespective of any change in quantities during the execution of the Contract.

The Bidder shall fill in rates for all items where the words “rate only” appear in the “Total” column. “Rate Only” items have been included where:

- An alternative item or material is contemplated
- No work under the item is foreseen at bid stage but the possibility that such work may be required is not excluded.

For “Rate Only” items no quantities are given in the “Quantity” column but the quoted rate shall apply in the event of work under this item being required.

The Bidder shall be deemed to have inspected and examined the Site and its surroundings and information available in connection therewith and to have satisfied himself before submitting his tender (as far as is practicable) as to:

- the form and nature of the Site and its surroundings
- the hydrological and climatic conditions
- the extent and nature of work and materials necessary for the execution and completion of the Works
- the means of access to the Site and the accommodation he may require

and, in general, shall be deemed to have obtained all information (as far as is practicable) as to risks,
**SBD 3: PRICING CONDITIONS AND DETAIL**

contingencies and all other circumstances which may influence or affect his Tender.

**Correction of entries**

Incorrect entries shall not be erased or obliterated with correction fluid but must be crossed out neatly. The correct figures must be entered above or adjacent to the deleted entry, and the alteration must be initialled by the Bidder.

**Arithmetical errors**

Arithmetical errors found in the Bill of Quantities as a result of faulty multiplication or addition, will be corrected by the NRF Agent/Engineer at the bid evaluation stage.

**Units of measurement**

The units of measurement described in the Bill of Quantities are metric units for which the standard international abbreviations are used. Abbreviations which may appear in the Bill of Quantities are as follows:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>millimetre</td>
</tr>
<tr>
<td>m</td>
<td>metre</td>
</tr>
<tr>
<td>kW</td>
<td>kilowatt</td>
</tr>
<tr>
<td>m²</td>
<td>square metre</td>
</tr>
<tr>
<td>No.</td>
<td>number</td>
</tr>
<tr>
<td>%</td>
<td>percent</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>sum</td>
<td>lump sum</td>
</tr>
<tr>
<td>Prov sum</td>
<td>Provisional sum</td>
</tr>
<tr>
<td>h</td>
<td>hour</td>
</tr>
<tr>
<td>m³</td>
<td>cubic metre</td>
</tr>
</tbody>
</table>

**2 Bills of quantities errors and omissions:**

The bills of quantities provided must be completed in full. In the event that an item is present in the BoQ that is not required for the bidder’s proposed solution, the item shall be clearly marked as not applicable.

The offer amount stated in this SBD 3 provided by the bid submission is the final offer for bid purposes. In the event that any errors, omissions, rate imbalances, or a difference to the form of offer final amount are identified in the BoQ, the Bidder will be notified.

The contractor will be offered the opportunity to correct their bid offer, or correct the BoQ in order to match the final offer amount. The corrected BoQ will be subject to the NRF Agent/Engineer’s approval.

If the bidder does not accept the corrected bid offer, cannot reach consensus with the NRF on a corrected price offer, or is unwilling to correct his BoQ rates to match the final offer, the bidder is disqualified.

**4 The Pricing Strategy is:**

Re-measurement Contract.

**5 Price adjustments for variations in the costs of special materials are not allowed.**

**6 Pricing Schedule:** In terms of General Conditions of contract clause 17.1, the price schedule remains unchanged for the duration of the contract with the NRF accepting no changes, extensions, or additional ad hoc costs to the pricing conditions of the contract.

**7 Price Adjustments:** Price adjustments and their corresponding rules for the managing price risks on the basis of the NRF and the contracted bidder sharing the risk equally.
SBD 3: PRICING CONDITIONS AND DETAIL

**Re-Measurable Adjustments:** Where items are marked re-measurable the remeasured amount is only accepted where signed off by the Contractor and the NRF’s Agent/Engineer.

**Planned Maintenance:** Maintenance labour charge rates will be increased/decreased according to the CPI, from the values provided in this document. All rate changes are negotiated prior to change and approved by all parties in writing. 6% CPI price escalation per annum must be used for illustrative and comparison purposes.

**Labour Rates for Incidental/Ad hoc Maintenance:** Maintenance labour charge rates will be increased/decreased according to the CPI, from the values provided in this document. All rate changes are negotiated prior to change and approved by all parties in writing. 6% CPI price escalation per annum must be used for illustrative and comparison purposes.

**INCIDENTAL WORK (NON-SCHEDULED) UNFORESEEN AT TIME OF BID**

Any work not included under the scheduled maintenance works shall be deemed additional or non-scheduled work and will be charged at the following rates (all rates INCL VAT). Labour rates shall include all travelling. Labour time shall be calculated for the time spent on site only.

**Generator and UPS**

Normal hours shall include Saturdays.

<table>
<thead>
<tr>
<th>Item</th>
<th>Generator and UPS Labour Rates</th>
<th>Normal hours (R/hours)</th>
<th>After hours (R/hour)</th>
<th>Sunday (R/hour)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Labourers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Semi-skilled</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Skilled</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Site Manager</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Engineer/Technologist</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Spare Parts and consumables:** supplied as required with the parts and consumables prices agreed at the commencement of each year. All rate changes are negotiated prior to change and approved by all parties in writing. All Parts and consumables on managed through issue of separate purchase orders when required.

**THIRD PARTY PROCUREMENT**

Cost shall be net cost (INCL VAT) of parts delivered to site with all discounts deducted. Original tax invoices from the service providers to be submitted with the Contractor’s invoice.

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
<th>Mark-up (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>R 0,00 to R 2000,00</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>R 2000,01 to R 10 000,00</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>R 10 000,01 to R 50 000,00</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Cost over R 50 000,00</td>
<td></td>
</tr>
</tbody>
</table>

**SPARE PARTS**
The spare list has to be prepared on the basis of bidders best current spares prices (INCL. VAT). The actual costs of spares will be reimbursed on submission of invoices and suppliers supporting documents. All verified invoices will be paid including the agreed mark-up percentages.

The contractor must provide as part of the maintenance manual, a list of spare parts.

**Ceiling Price Calculation:** The NRF provides bidding estimates of quantities to allow for the calculation of a bidding price (the Offer Price) for the contract that allows an equal comparison basis equitable to all bidders for award selection. The contract price is determined by all purchase orders issued in terms of the contract for work, re-measurement adjustments as approved by the NRF Agent/Engineer, maintenance performed, annual maintenance, consumables, spares, and incidentals.

**Commitment to Contracted Service Provider:** The NRF, through the signed contract, guarantees its procurement of the specified goods and/or services is from the contracted party only.

**Commitment of funding to Purchase Orders issued in terms of the Contract:** The NRF, when issuing the written purchase order stipulating quantity, description, delivery date, and the unit price as set out in this contract, guarantees that the funding is available for the value of that purchase order.

**Price Delivery Points are:**

Data Centre, NRF Corporate Building, Meiring Naude Road

**Application of Preference Points:** Pricing is subject to the addition of Preference Points as stipulated below - Standard Bidding Document 6.1 Preference claim form.

**SUMMARY PRICING SCHEDULE**

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<tr>
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<tbody>
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<tr>
<td>1</td>
<td>PRELIMINARIES AND GENERAL</td>
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<td>2</td>
<td>GENERAL ELECTRICAL</td>
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</tr>
<tr>
<td>3</td>
<td>GENERATOR WORKS</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>UPS INSTALLATION</td>
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<td>5</td>
<td>MAINTENANCE SERVICE</td>
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<td>15% VAT</td>
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<td>TOTAL AMOUNT (INCL VAT)</td>
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<td>BILL 1</td>
<td>PRELIMINARIES AND GENERAL</td>
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<td>Deposits and Fees</td>
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<td>Enclosure of the Works</td>
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<td>1.3</td>
<td>Plant, Equipment, Sheds and Offices</td>
<td>Time Item</td>
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<td><strong>Temporary Services</strong></td>
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<td>1.4</td>
<td>Telecommunication facilities</td>
<td>Time Item</td>
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<tr>
<td>1.5</td>
<td>Ablution Facilities</td>
<td>Time Item</td>
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<td></td>
<td><strong>General</strong></td>
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<td>1.6</td>
<td>Protection of the works</td>
<td>Value Item</td>
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<td>1.7</td>
<td>Protection/isolation of existing services</td>
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<td>1.8</td>
<td>Security of the works</td>
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<td>1.9</td>
<td>Notice before covering work</td>
<td>Value Item</td>
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<td>1.10</td>
<td>Works cleaning and clearing</td>
<td>Value Item</td>
</tr>
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<td>1.11</td>
<td>Overhand work</td>
<td>Value Item</td>
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<td>1.12</td>
<td>Instruction manuals and guarantees</td>
<td>Fixed Item</td>
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<td>1.13</td>
<td>Client training</td>
<td>Fixed Item</td>
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<td>1.14</td>
<td>As-built information</td>
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**PRELIMINARIES AND GENERAL**

Carried to Summary
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<tr>
<th>ITEM</th>
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<th>QTY</th>
<th>RATE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>GENERATOR ELECTRICAL WORKS</strong> Supply and install surface mounted distribution board, complete with frame, busbars, DIN rails, internal wiring, legend and cover, Switchgear, Warning signs, labelling, etc.</td>
<td></td>
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<tr>
<td></td>
<td>Distribution board DB-DATA, as per drawing P18047-TN-ELE-001</td>
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<tr>
<td>2</td>
<td>Connection to Existing DB 80A 3-pole breaker to match existing</td>
<td>S + I</td>
<td>No</td>
<td>1</td>
<td></td>
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<tr>
<td>3</td>
<td>Trenching for electrical cables</td>
<td>Excav</td>
<td>m3</td>
<td>42</td>
<td></td>
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<td>4</td>
<td>Riversand backfilling</td>
<td>S + I</td>
<td>m3</td>
<td>7.6</td>
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<td>5</td>
<td>Warning Tape</td>
<td>S + I</td>
<td>m</td>
<td>125</td>
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<tr>
<td>6</td>
<td>110mm UPVC sleeves</td>
<td>S + I</td>
<td>m</td>
<td>80</td>
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<td>7</td>
<td>50mm UPVC sleeves for modbus</td>
<td>S + I</td>
<td>m</td>
<td>30</td>
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<tr>
<td>8</td>
<td><strong>Modbus cabling</strong></td>
<td>S + I</td>
<td>m</td>
<td>250</td>
<td></td>
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<tr>
<td>9</td>
<td>Reinstatement of Paving</td>
<td>Labour</td>
<td>m²</td>
<td>30</td>
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<td>10</td>
<td><strong>Supply and install Manhole including all masonry works, earthworks, compaction, etc. required for full installation</strong></td>
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<tr>
<td></td>
<td>600x600x800 mm manhole, as per drawing P18047-TN-ELE-901</td>
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<td>ITEM</td>
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<td>-----------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>10</td>
<td>600/1000V CU/PVC/SWA/PVC low voltage cables installed in trenches or sleeves</td>
<td>S + I No 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>35 mm² x 4 core</td>
<td>S + I m 180</td>
<td></td>
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</tr>
<tr>
<td>12</td>
<td>6 mm² x 4 core</td>
<td>S + I m 150</td>
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</tr>
<tr>
<td></td>
<td><strong>Bare Copper Earth Wires</strong></td>
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<tr>
<td>13</td>
<td>25 mm²</td>
<td>S + I m 180</td>
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<tr>
<td>14</td>
<td>4 mm²</td>
<td>S + I m 150</td>
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<td></td>
<td><strong>Cable ends for CU/PVC/SWA/PVC cables including glands, lugs and connections</strong></td>
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<td>15</td>
<td>35 mm² x 4 core</td>
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<td>16</td>
<td>6 mm² x 4 core</td>
<td>S + I No 4</td>
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<td></td>
<td><strong>Ends for Bare Copper Earth Wires including glands, lugs and connections</strong></td>
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<td>17</td>
<td>25 mm²</td>
<td>S + I No 12</td>
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<tr>
<td>18</td>
<td>4 mm²</td>
<td>S + I No 4</td>
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<td></td>
<td><strong>Shaft UPS Connection</strong></td>
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<tr>
<td>19</td>
<td>PVC rigid conduit. Rate to include all drawboxes, glands, bending, cut-offs, draw wires, etc. for complete installation</td>
<td>S + I m 30</td>
<td></td>
<td></td>
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<tr>
<td>20</td>
<td>25 mm Chased in walls</td>
<td>S + I m 50</td>
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<td></td>
<td>25 mm Surface Mounted</td>
<td>S + I m 50</td>
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<tr>
<td>ITEM</td>
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<tr>
<td>21</td>
<td>PVC Insulated single strand wire. Rate to include cut-offs, terminations, etc. for complete installation</td>
<td></td>
<td>4 mm²</td>
<td>S + I</td>
<td>m</td>
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<td>22</td>
<td>Bare Copper Earth Wires. Rate to include cut-offs, terminations, etc. for complete installation</td>
<td></td>
<td>2,5 mm²</td>
<td>S + I</td>
<td>m</td>
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<td>23</td>
<td>Existing socket outlets connected to new UPS feeds</td>
<td></td>
<td></td>
<td>S + I</td>
<td>No</td>
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<tr>
<td>24</td>
<td>Shaved-pin 16A 3-pin red socket outlet including 100mmx100mmx50mm box, cover plates, etc.</td>
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<td></td>
<td>S + I</td>
<td>No</td>
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<td>25</td>
<td>Replace network switch socket with shaved-pin red socket (16A, 3-pin)</td>
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<td>S + I</td>
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<td>26</td>
<td>150mm galvanised medium-duty perforated cable tray installed in ceiling void</td>
<td></td>
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<td>S + I</td>
<td>m</td>
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<td>Test, commission and number the power distribution installation including issue of Certificate of Compliance</td>
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<td>GENERATOR WORKS</td>
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<td>Generator with enclosure, alarms, controls, etc., as per specifications and drawings</td>
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<tr>
<td>ITEM</td>
<td>DESCRIPTION</td>
<td>UNIT</td>
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<td>RATE</td>
<td>AMOUNT</td>
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<tr>
<td>1</td>
<td>40 kVA (Prime) Generator including powder coated mild steel canopy</td>
<td>S+I</td>
<td>No</td>
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<td>2</td>
<td>Installation of plinth, including all earthworks etc., for complete installation</td>
<td>S+I</td>
<td>No</td>
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<td>Generator Controller (Master)</td>
<td>S+I</td>
<td>No</td>
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<td>Generator Controller (Slave)</td>
<td>S+I</td>
<td>No</td>
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<td>5</td>
<td>GSM Module</td>
<td>S+I</td>
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<td>6</td>
<td>Rigging</td>
<td>S+I</td>
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<td>7</td>
<td>Signage OHS</td>
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<td>Manual Fuel Pump</td>
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<td>First Fill</td>
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<td>No</td>
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<td><strong>Test, commission and number the power distribution</strong></td>
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<tr>
<td></td>
<td><strong>installation including issue of Certificate of Compliance</strong></td>
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<td>Factory Acceptance Test</td>
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<td>Site Acceptance Test and Commission</td>
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**BILL NO 3**

GENERATOR WORKS

Carried to Summary

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<td><strong>UPS and batteries with enclosure,</strong></td>
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<tr>
<td></td>
<td></td>
<td><strong>alarms, controls, etc., as per specifications and drawings</strong></td>
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<td><strong>40kVA in-line Double Conversion UPS</strong></td>
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<td>Batteries for UPS 1</td>
<td>S + I</td>
<td>No 2</td>
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<td>Batteries for UPS 2</td>
<td>S + I</td>
<td>kW.h 18</td>
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<td>Cabinets for Batteries</td>
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<td>kW.h 18</td>
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<td>UPS Parallel</td>
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**BILL NO 5**

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<tr>
<td>1</td>
<td>Generator</td>
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<td>1.1</td>
<td>Preventative services including all contract management, travel, reporting, tools, and scheduled consumable replacements</td>
<td>each</td>
<td>3 Per year</td>
<td>6 years</td>
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<tr>
<td>1.2</td>
<td>Major Service including all contract management, travel, reporting, tools, and scheduled consumable replacements</td>
<td>each</td>
<td>1 Per year</td>
<td>6 years</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>UPS and Battery Installation</td>
<td>-</td>
<td>-</td>
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<tr>
<td>2.1</td>
<td>Preventative services including all contract management, travel, reporting, tools, and scheduled consumable replacements</td>
<td>each</td>
<td>3 Per year</td>
<td>6 years</td>
<td></td>
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<tr>
<td>2.2</td>
<td>Major Service including all contract management, travel, reporting, tools, and scheduled consumable replacements</td>
<td>each</td>
<td>1 Per year</td>
<td>6 years</td>
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</table>
TEST CHECK OF SYSTEM SWITCHING ON

3.1 Test of system being triggered by power failure and the Data Centre switching over to the back-up power system including travel

BILL NO 5
MAINTENANCE
Carried to Summary

EXECUTION/DELIVERY CONDITIONS

OHS  Occupational Health and Safety when working on NRF sites: All personnel performing work on NRF site/s as part of this contract are responsible to obtain safety induction.

Over and above the obligations provided by the Occupational Health and Safety Act (OHS Act No 85 of 1993 and its Regulations, known as ‘the Act’), the contracted party meets with all relevant health and safety instructions as given to them by site safety personnel, where relevant. Personal protection equipment including closed safety shoes, hard hats, height safety equipment, and high visibility vests are worn at all times while on the work site. All personnel are to obey the relevant instructions, including signage, related to restricted access and speed limits on all sites.

The contracted party, once signing the contract (SBD 7), is responsible for itself, its employees, and those people affected by its operations in terms of the Act the regulations promulgated in terms thereof. The contracted party performs all work and uses equipment on site complying with the provisions of the Act.

To this end, the contracted party shall make available to the NRF on the valid Letter of Good Standing in terms of the COID Act and ensures its validity does not expire while executing this bid, where applicable. The contracted party furnishes its registration number with the office of the Compensation Commissioner. The contracted party enters into a Section 37.2 agreement in terms of Occupational Health and Safety Act (OHS Act No 85 of 1993 and its Regulations) that the NRF drafts.

The contracted party maintains a health and safety plan complying with the requirements of The Act at the work site during the period that contracted work takes place on the site.

The NRF manages the contracted party in his capacity for the execution of this contract to meet the provisions of the said Act and the regulations promulgated in terms thereof. The contracted party accepts liability for any contraventions to the Act. Each member of the contracted party’s team (including sub-contracted personnel), submit a signed indemnity form prior to entering the work site and kept in the contracted party’s health and safety file.

1  When the Defects Liability Period Starts:

“Defects Liability Period” means the period stated in the Contract Data, commencing on the date indicated on the Certificate of Completion or Certificates of Completion in the event of more than one Certificate of Completion is issued for different parts of the Works, during which the Contractor has both the right and the obligation to make good defects in the materials, Plant and workmanship covered by the Contract.

Defects liability period starts from the acceptance of the plant by the NRF after all commissioning and testing.
## EXECUTION/DELIVERY CONDITIONS

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
| 1 | is completed and signed off by the NRF Agent/Engineer  
**Defects liability period per GCC 15:**  
12 months |
| 2 | **Delivery Management – First Delivery**  
The time for achieving First Delivery of the whole of the works is as per programme provided as part of the Bidder’s returnable documents, measured from the Commencement Date. The time is measured by the number of working days |
| 3 | **The name of the NRF’s Agent is:**  
Delta Built Environment Consultants Pty (Ltd) |
| 4 | **Definition of “Value of Works”**  
“Value of Works” means the value of the Works certified by the NRF Agent/Engineer as having been satisfactorily executed and shall include the value of the works done, the value of the materials and/or plant and Contract Price Adjustments. |
| 5 | **The documentation required before commencement with Works execution are:**  
Risk Assessment with the NRF Agent/Engineer, NRF Building Maintenance, and NRF ICT  
Health and Safety Plan  
Finalised Project Plan  
Security  
Insurance  
Guarantee for performance if where a deposit is required |
| 6 | **The time to submit the documentation required before commencement with Works execution is:**  
3 weeks |
| 7 | **Access the Site**  
a. The contractor will not have exclusive access to the site  
b. The contractor shall notify the Employer and NRF Agent/Engineer of any works that may cause disruption to the normal operational of the building including noise, dust, power disruptions, etc., at least 2 weeks in advance. The Contractor may not start disruptive works unless explicit approval has been granted by the Employer. The employer must provide definite approval or disapproval at least 1 week before the disruptive works are to start.  
c. The Employer shall use their best efforts to accommodate the contractor’s requirements for disruptive works during normal working hours.  
d. In the event that disruptive works cannot be accommodated during normal working hours, the Contractor shall complete the disruptive works after normal working hours without additional compensation. |
| 8 | **The non-working days are:**  
Saturdays and Sundays |
**EXECUTION/DELIVERY CONDITIONS**

The special non-working days are:

- South African Public Holidays;
- The year-end break commencing on 16 December until the Sunday preceding the first working Monday of January of the succeeding year.

9 **Commencement Date**

On the Commencement Date, the NRF Agent/Engineer shall deliver to the Contractor three (3) copies, at no cost to the Contractor, of the drawings and any instructions required for the commencement of the Works. The cost of any additional copies of such drawings and/or instructions, as may be required by the Contractor, will be for the account of the Contractor.

10 **The latent defect period for all works is for GCC15:**

6 years.

11 **Monies due to the NRF:**

Provided that, should the Contractor on demand not pay the amount of such costs to the NRF, such amount may be determined and deducted by the NRF from any amount due to or that may become due to the Contractor under this or any other previous or subsequent contract between the Contractor and the NRF.

12 **Clean Site and Debris Removal:**

The Contractor shall at all times proceed immediately to remove or dispose of any debris arising from damage to or destruction of the Works and to rebuild, restore, replace and/or repair the Works, failing which the Employer may cause same to be done and recover the reasonable costs associated therewith from the Contractor.

13 **Public liability and professional indemnity insurance to be effect by the Contractor to a minimum value of in conjunction with GCC 11:**

R 5 million

The insurances shall be effected with an insurance company registered in the Republic of South Africa. The Contractor shall submit the insurance policy to the NRF for approval, if so requested.

**PERFORMANCE/SERVICE LEVEL CONDITIONS**

1. The NRF measures the contracted bidder’s performance against these in the execution of the contract. The contracted bidder recognises that its failure to meet the performance levels has material adverse impact on the operations of NRF and that the damage from the contracted bidder’s failure to meet any performance level is not susceptible to precise determination. The NRF excuses the contracted bidder from failing to comply with the performance levels to the extent that non-performance or delayed performance is solely and directly attributable to an act or omission of the NRF or its staff or circumstances of force majeure as referred to in this Agreement.

2. If the contracted bidder fails to meet any performance level:
   
   a. The contracted bidder shall investigate and report on the root causes of the performance level failure;
   
   b. Promptly correct the failure and begin meeting the set performance levels;
   
   c. Advise the NRF as and to the extent requested by the NRF of the status of remedial efforts being
## PERFORMANCE/SERVICE LEVEL CONDITIONS

undertaken with respect to such performance level failure; and

d. Take appropriate preventive measures to prevent the recurrence of the performance level failure.

### STATEMENT OF PERFORMANCE LEVELS FOR SERVICES/GOODS

<table>
<thead>
<tr>
<th>PERFORMANCE BEING MEASURED</th>
<th>MEASUREMENT METHODOLOGY</th>
<th>PENALTY AND LEVEL APPLICABLE FROM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivery of supply and installation on time</td>
<td>Number of days in arrears as determined by the NRF’s Agent/Engineer</td>
<td>The penalty for failing to complete the Works is: R 10 000 per working day</td>
</tr>
<tr>
<td>Preventative maintenance servicing not kept to</td>
<td>NRF’s staff verification of work done</td>
<td>The penalty for failing to deliver the agreed maintenance program per program dates:: R 2 500.00 per calendar day</td>
</tr>
</tbody>
</table>
| Back up facility does not supply power to the server room | Within one (1) minute of power loss
Back-up power to the server room supplied within two (2) minutes
Verification: Monthly check performed by the contractor and the NRF staff (separate line item in price schedule due to the criticality of this requirement to the data centre) | The penalty for data centre down time as result of no power is R 2 000.00 per minute
The risk of the penalty is mitigated through the contractor conducting the monthly test |
| Response to customer call outs | Maintenance provider response to calls within 8 hours | The penalty for failing to respond is R 500.00 per working day |

## SBD 4 - DECLARATION OF INTEREST WITH GOVERNMENT

Any legal person, including persons employed by the State (meaning any national or provincial department; national or provincial public entity; or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act No. 1 of 1999); any municipality or municipal entity; provincial legislature; national Assembly or the national Council of provinces; or Parliament), or persons having a kinship with persons employed by the State, including a blood relationship, may make an offer or offers in terms of this invitation to Bid (includes an advertised competitive Bid, a limited Bid, a proposal or written price quotation). In view of possible allegations of favouritism, should the resulting Bid, or part thereof, be awarded to persons employed by the State, or to persons connected with or related to them, it is required that the Bidder or his/her authorised representative, declare his/her position in relation to the evaluating/adjudicating authority where:

a. The Bidder is employed by the State; and/or
b. The legal person on whose behalf the Bidding Document is signed, has a relationship with persons/s person who is/are involved in the evaluation and or adjudication of the Bid(s), or where it is known
<table>
<thead>
<tr>
<th><strong>SBD 4 - DECLARATION OF INTEREST WITH GOVERNMENT</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>that such a relationship exists between the person or persons for or on whose behalf the declarant acts and persons who are involved with the evaluation and/or adjudication of the Bid.</td>
</tr>
</tbody>
</table>

In order to give effect to the above, the following questionnaire must be completed and submitted with this Bid:

<table>
<thead>
<tr>
<th>Full Name of Bidder or his/her representative:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identity Number:</td>
</tr>
<tr>
<td>Position occupied in the Company (director, trustee, shareholder, member):</td>
</tr>
<tr>
<td>Registration number of company, enterprise, close corporation, partnership agreement:</td>
</tr>
<tr>
<td>Tax Reference Number:</td>
</tr>
<tr>
<td>VAT Registration Number:</td>
</tr>
</tbody>
</table>

The names of all directors/trustees/shareholders/members, their individual identity numbers, tax reference numbers and, if applicable, employee/PERSAL numbers must be indicated in a separate schedule including the following questions:

<table>
<thead>
<tr>
<th>Schedule attached with the above details for all directors/members/shareholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are you or any person connected with the Bidder presently employed by the State? If so, furnish the following particulars in an attached schedule</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of person/ director/ trustee/ shareholder/member:</td>
<td></td>
</tr>
<tr>
<td>Name of State institution at which you or the person connected to the Bidder is employed</td>
<td></td>
</tr>
<tr>
<td>Position occupied in the State institution</td>
<td></td>
</tr>
<tr>
<td>Any other particulars:</td>
<td></td>
</tr>
</tbody>
</table>

If you are presently employed by the State, did you obtain the appropriate authority to undertake remunerative work outside employment in the public sector?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

If Yes, did you attach proof of such authority to the Bid document?

If No, furnish reasons for non-submission of such proof as an attached schedule
### SBD 4 - DECLARATION OF INTEREST WITH GOVERNMENT

(Note: Failure to submit proof of such authority, where applicable, may result in the disqualification of the Bid.)

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did you or your spouse or any of the company’s directors/trustees/shareholders/members or their spouses conduct business with the State including any business units of the National Research Foundation in the previous twelve months?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If so, furnish particulars as an attached schedule</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you, or any person connected with the Bidder, have any relationship (family, friend, other) with a person employed by the State and who may be involved with the evaluation and or adjudication of this Bid?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If so, furnish particulars as an attached schedule.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you or any of the directors/trustees/shareholders/members of the company have any interest in any other related companies whether or not they are bidding for this contract?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If so, furnish particulars as an attached schedule:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SBD 6.1 - PREFERENCE POINTS CLAIMED

**NB:** BEFORE COMPLETING THIS FORM, BIDDERS MUST STUDY THE GENERAL CONDITIONS, DEFINITIONS, AND DIRECTIVES APPLICABLE IN RESPECT OF B-BBEE, AS PRESCRIBED IN THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017.

1. **GENERAL CONDITIONS**
   1.1. The following preference point systems are applicable to all bids:
      1.1.1. the 80/20 system for requirements with a Rand value of up to R 50 000 000 (all applicable taxes included); and 1.1.2. The 90/10 system for requirements with a Rand value above R 50 000 000 (all applicable taxes included)

The maximum points for this bid are allocated as follows:

<table>
<thead>
<tr>
<th>Points</th>
<th>Price</th>
<th>B-BBEE STATUS LEVEL OF CONTRIBUTION</th>
<th>TOTAL POINTS FOR PRICE AND B-BBEE MUST NOT EXCEED</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td></td>
<td>20</td>
<td>100</td>
</tr>
</tbody>
</table>

1.2. Failure on the part of a bidder to submit proof of B-BBEE Status level of contributor together with the bid will be interpreted to mean that preference points for B-BBEE status level of contribution are not claimed.

1.3. The purchaser reserves the right to require either of a bidder, before a bid is adjudicated or at any time subsequently, to substantiate any claim concerning preferences, in any manner required by the purchaser.

1.4. POINTS AWARDED FOR PRICE

THE 80/20 OR 90/10 PREFERENCE POINT SYSTEMS
### SBD 6.1 - PREFERENCE POINTS CLAIMED

A maximum of 80 or 90 points is allocated for price on the following basis:

<table>
<thead>
<tr>
<th>System</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>80/20</td>
<td>[ Ps = 80\left(1 - \frac{Pt - P_{min}}{P_{min}}\right) ] OR [ Ps = 90\left(1 - \frac{Pt - P_{min}}{P_{min}}\right) ]</td>
</tr>
</tbody>
</table>

Where:
- \( Ps \) = Points scored for price of bid under consideration
- \( Pt \) = Price of bid under consideration
- \( P_{min} \) = Price of lowest acceptable bid

2. **POINTS AWARDED FOR B-BBEE STATUS LEVEL OF CONTRIBUTOR**

In terms of Regulation 6 (2) and 7 (2) of the Preferential Procurement Regulations, preference points must be awarded to a bidder for attaining the B-BBEE status level of contribution in accordance with the table below:

<table>
<thead>
<tr>
<th>B-BBEE Status Level of Contributor</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>Non-compliant contributor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of points (90/10 system)</td>
<td>10</td>
<td>9</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Number of points (80/20 system)</td>
<td>20</td>
<td>18</td>
<td>14</td>
<td>12</td>
<td>8</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

3. **BID DECLARATION**

Bidders who claim points in respect of B-BBEE Status Level of Contribution must complete the following:

**B-BBEE STATUS LEVEL OF CONTRIBUTOR CLAIMED IN TERMS OF PARAGRAPHS 1 AND 2**

B-BBEE Status Level of Contributor: = ………(maximum of 10 or 20 points)

(Points claimed in respect of paragraph 3 must be in accordance with the table reflected in paragraph 2 and must be substantiated by relevant proof of B-BBEE status level of contributor.

4. **SUB-CONTRACTING**

Will any portion of the contract be sub-contracted?

(Tick applicable box)

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

If yes, indicate:

1. What percentage of the contract will be subcontracted……..% 
2. The name of the sub-contractor………………………………………..
3. The B-BBEE status level of the sub-contractor…………………………
4. Whether the sub-contractor is an EME or QSE

(Tick applicable box)

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

Specify, by ticking the appropriate box, if subcontracting with an enterprise in terms of Preferential Procurement Regulations, 2017:
### SBD 6.1 - PREFERENCE POINTS CLAIMED

<table>
<thead>
<tr>
<th>Designated Group: An EME or QSE which is at least 51% owned by:</th>
<th>EME</th>
<th>QSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black people</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Black people who are youth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black people who are women</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black people with disabilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black people living in rural or underdeveloped areas or townships</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooperative owned by black people</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black people who are military veterans</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

OR

<table>
<thead>
<tr>
<th>Any EME</th>
<th>Any QSE</th>
</tr>
</thead>
</table>

5. **DECLARATION WITH REGARD TO COMPANY/FIRM**

- **Name of company/firm:** ……………………………………………………………………………|
- **VAT registration number:** ……………………………………………………………………………|
- **Company registration number:** ………………………………………………………………………|

**TYPE OF COMPANY/ FIRM**

- Partnership/Joint Venture /Consortium
- One person business/sole proprietor
- Close corporation
- Company
- (Pty) Limited

[TICK APPLICABLE BOX]

**DESCRIBE PRINCIPAL BUSINESS ACTIVITIES**

- ………………………………………………………………… ……………………………………………………………
- ………………………………………………………………… ……………………………………………………………
- ………………………………………………………………… ……………………………………………………………
- ………………………………………………………………… ……………………………………………………………

**COMPANY CLASSIFICATION**

- Manufacturer
- Supplier
- Professional service provider
- Other service providers, e.g. transporter, etc.

[TICK APPLICABLE BOX]

**Total number of years the company/firm has been in business:** ……………………………

I/we, the undersigned, who is / are duly authorised to do so on behalf of the company/firm, certify that the points claimed, based on the B-BBEE status level of contributor indicated in paragraphs 1 and 3 of the foregoing certificate, qualifies the company/ firm for the preference(s) shown and I / we acknowledge that:
SBD 6.1 - PREFERENCE POINTS CLAIMED

1. The information furnished is true and correct;

2. The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;

3. In the event of a contract being awarded as a result of points claimed as shown in paragraphs 1 and 3, the contractor may be required to furnish documentary proof to the satisfaction of the purchaser that the claims are correct;

4. If the B-BBEE status level of contributor has been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the purchaser may, in addition to any other remedy it may have –

   (a) disqualify the person from the bidding process;

   (b) recover costs, losses or damages it has incurred or suffered as a result of that person’s conduct;

   (c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;

   (d) recommend that the bidder or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted by the National Treasury from obtaining business from any organ of state for a period not exceeding 10 years, after the Audi alteram partem (hear the other side) rule has been applied; and

   (e) forward the matter for criminal prosecution.

SBD 8 - DECLARATION OF BIDDER’S PAST SCM PRACTICES

Is the Bidder or any of its directors listed on the National Treasury’s Database of Restricted Suppliers as companies or persons prohibited from doing business with the public sector? If Yes, furnish particulars as an attached schedule:

☐ Yes ☐ No

Is the Bidder or any of its directors listed on the Register for Tender Defaulters in terms of Section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004)? If Yes, furnish particulars as an attached schedule:

☐ Yes ☐ No

Was the Bidder or any of its directors convicted by a court of law (including a court outside of the Republic of South Africa) for fraud or corruption during the past five years? If Yes, furnish particulars as an attached schedule:

☐ Yes ☐ No

Was any contract between the Bidder and any NRF terminated during the past five years because of failure to perform on or comply with the contract? If Yes, furnish particulars as an attached schedule:

☐ Yes ☐ No

The Database of Restricted Suppliers and Register for Tender Defaulters resides on the National Treasury’s website (www.treasury.gov.za) and can be accessed by clicking on its link at the bottom of the home page.
<table>
<thead>
<tr>
<th>SBD 9: CERTIFICATE OF INDEPENDENT BID DETERMINATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>I, the signatory to this document, in submitting this Bid in response to the invitation for the Bid made by the National Research Foundation, do hereby make the following statements that I certify to be true and complete in every respect:</td>
</tr>
<tr>
<td>I have read and I understand the contents of this Certificate;</td>
</tr>
<tr>
<td>I understand that the Bid will be disqualified if this Certificate is found not to be true and complete in every respect;</td>
</tr>
<tr>
<td>I am authorised by the Bidder to sign this Certificate, and to submit the Bid, on behalf of the Bidder;</td>
</tr>
<tr>
<td>Each person whose signature appears on the Bid has been authorised by the Bidder to determine the terms of, and to sign, the Bid on behalf of the Bidder;</td>
</tr>
<tr>
<td>For the purposes of this Certificate and the accompanying Bid, I understand that the word “competitor” shall include any individual or organisation, other than the Bidder, whether or not affiliated with the Bidder, who:</td>
</tr>
<tr>
<td>a. Has been requested to submit a Bid in response to this Bid invitation;</td>
</tr>
<tr>
<td>b. Could potentially submit a Bid in response to this Bid invitation, based on their qualifications, abilities or experience; and</td>
</tr>
<tr>
<td>c. Provides the same goods and services as the Bidder and/or is in the same line of business as the Bidder</td>
</tr>
<tr>
<td>The Bidder has arrived at the accompanying Bid independently from, and without consultation, communication, agreement, or arrangement with any competitor. However, communication between partners in a joint venture or consortium (meaning an association of persons for combining their expertise, property, capital, efforts, skill, and knowledge in an activity for the execution of the bid) will not be construed as collusive bidding.</td>
</tr>
<tr>
<td>In particular, without limiting the generality of paragraphs above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:</td>
</tr>
<tr>
<td>a. Prices;</td>
</tr>
<tr>
<td>b. Geographical area where product or service will be rendered (market allocation);</td>
</tr>
<tr>
<td>c. Methods, factors or formulas used to calculate prices;</td>
</tr>
<tr>
<td>d. The intention or decision to submit or not to submit, a Bid;</td>
</tr>
<tr>
<td>e. The submission of a Bid which does not meet the specifications and conditions of the Bid; or</td>
</tr>
<tr>
<td>f. Bidding with the intention not to win the Bid.</td>
</tr>
<tr>
<td>In addition, there have been no consultations, communications, agreements, or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this Bid invitation relates.</td>
</tr>
<tr>
<td>The terms of this Bid have not been, and will not be, disclosed by the Bidder, directly or indirectly, to any competitor, prior to the date and time of the official Bid opening or of the awarding the bid or to the signing of the contract.</td>
</tr>
<tr>
<td>I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to Bids and contracts, Bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of Section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from</td>
</tr>
</tbody>
</table>

Bid Number: NRF/CORP ICT 007/2018  Page 79 of 98  Ver. Standard 2018-6a clean
<table>
<thead>
<tr>
<th><strong>SBD 9: CERTIFICATE OF INDEPENDENT BID DETERMINATION</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation</td>
</tr>
<tr>
<td>Criteria / risks</td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>Power solution was in accordance with the issued specifications</td>
</tr>
<tr>
<td>Project deliverable times were in accordance with your agreed deliverable times</td>
</tr>
<tr>
<td>UPS and Generator come on line immediately the mains failure is detected</td>
</tr>
<tr>
<td>Customer relations</td>
</tr>
<tr>
<td>Overall Impression</td>
</tr>
<tr>
<td>Approximate value of contract</td>
</tr>
</tbody>
</table>

Would you use the provider again?  
❑ YES  ❑ NO

Completed by:  
Signature:  
Company Name:  
Contact Telephone Number:  
Date:
<table>
<thead>
<tr>
<th>Criteria / risks</th>
<th>Below requirements</th>
<th>Meets requirements</th>
<th>Exceeds requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preventative maintenance delivered the correct amount of preventative maintenance at the correct time</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UPS and Generator come on line immediately the mains failure is detected</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spare parts and consumable management including cost management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance customer care</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall Impression</td>
<td></td>
<td>Other comments</td>
<td></td>
</tr>
<tr>
<td>Approximate value of contract</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Would you use the provider again?</td>
<td></td>
<td>☐ YES ☐ NO</td>
<td></td>
</tr>
</tbody>
</table>

**Completed by:**

**Signature:**

**Company Name:**

**Contact Telephone Number:**

**Date:**
## GENERAL CONDITIONS

In this document words in the singular also mean in the plural and vice versa, words in the masculine mean in the feminine and neuter, words “department” means organs of state inclusive of public entities and vice versa, and the words “will/should” mean "must".

The National Research Foundation cannot amend the National Treasury's General Conditions of Contract (GCC). The National Research Foundation therefore appends Special Conditions of Contract (SCC) providing specific information relevant to a GCC clause below that GCC clause. Special contract conditions specific to this bid contract that are not part of the General Conditions section are listed in the above sections of this document. Whenever there is an unintended conflict, the provisions of the Special Conditions of Contract shall prevail over the General Conditions of Contract.

### GCC1 Definitions - The following terms shall be interpreted as indicated:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>“Closing time” means the date and hour specified in the bidding documents for the receipt of bids.</td>
</tr>
<tr>
<td>1.2</td>
<td>“Contract” means the written agreement entered into between the purchaser and the supplier, as recorded in the contract form signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference therein.</td>
</tr>
<tr>
<td>1.3</td>
<td>“Contract price” means the price payable to the supplier under the contract for the full and proper performance of his contractual obligations.</td>
</tr>
<tr>
<td>1.4</td>
<td>“Corrupt practice” means the offering, giving, receiving, or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution.</td>
</tr>
<tr>
<td>1.5</td>
<td>&quot;Countervailing duties&quot; imposed in cases where an enterprise abroad is subsidized by its government and encouraged to market its products internationally.</td>
</tr>
<tr>
<td>1.6</td>
<td>&quot;Country of origin&quot; means the place where the goods were mined, grown, or produced, or from which the services are supplied. Goods produced when, through manufacturing, processing or substantial and major assembly of components, a commercially recognized new product results that is substantially different in basic characteristics or in purpose or utility from its components.</td>
</tr>
<tr>
<td>1.7</td>
<td>&quot;Day&quot; means calendar day.</td>
</tr>
<tr>
<td>1.8</td>
<td>“Delivery” means delivery in compliance of the conditions of the contract or order.</td>
</tr>
<tr>
<td>1.9</td>
<td>“Delivery ex stock” means immediate delivery directly from stock actually on hand.</td>
</tr>
<tr>
<td>1.10</td>
<td>“Delivery into consignees store or to his site” means delivered and unloaded in the specified store or depot or on the specified site in compliance with the conditions of the contract or order, the supplier bearing all risks and charges involved until the supplies are so delivered and a valid receipt is obtained.</td>
</tr>
<tr>
<td>1.11</td>
<td>“Dumping” occurs when a private enterprise abroad market its goods on own initiative in the RSA at lower prices than that of the country of origin and which have the potential to harm the local industries in the RSA.</td>
</tr>
<tr>
<td>1.12</td>
<td>&quot;Force majeure&quot; means an event beyond the control of the supplier and not involving the supplier's fault or negligence and not foreseeable. Such events may include, but is not restricted to, acts of the purchaser in its sovereign capacity, wars, or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes.</td>
</tr>
</tbody>
</table>
### GENERAL CONDITIONS

1.13 "Fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of any bidder, and includes collusive practice among bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the bidder of the benefits of free and open competition.

1.14 "GCC" mean the General Conditions of Contract.

1.15 "Goods" means all of the equipment, machinery, and/or other materials that the supplier is required to supply to the purchaser under the contract.

1.16 "Imported content" means that portion of the bidding price represented by the cost of components, parts or materials which have been or are still to be imported (whether by the supplier or his subcontractors) and which costs are inclusive of the costs abroad, plus freight and other direct importation costs such as landing costs, dock dues, import duty, sales duty or other similar tax or duty at the South African place of entry as well as transportation and handling charges to the factory in the Republic where the supplies covered by the bid will be manufactured.

1.17 "Local content" means that portion of the bidding price, which is not included in the imported content if local manufacture does take place.

1.18 "Manufacture" means the production of products in a factory using labour, materials, components, and machinery and includes other related value-adding activities.

1.19 "Order" means an official written order issued for the supply of goods or works or the rendering of a service.

1.20 "Project site", where applicable, means the place indicated in bidding documents.

1.21 "Purchaser" means the organization purchasing the goods.

1.22 "Republic" means the Republic of South Africa.

1.23 "SCC" means the Special Conditions of Contract.

1.24 "Services" means those functional services ancillary to the supply of the goods, such as transportation and any other incidental services, such as installation, commissioning, provision of technical assistance, training, catering, gardening, security, maintenance and other such obligations of the supplier covered under the contract.

1.25 "Written" or "in writing" means handwritten in ink or any form of electronic or mechanical writing.

### GCC2 Application

2.1 These general conditions are applicable to all bids, contracts and orders including bids for functional and professional services, sales, hiring, letting and the granting or acquiring of rights, but excluding immovable property, unless otherwise indicated in the bidding documents.

2.2 Where applicable, special conditions of contract laid down to, cover specific supplies, services or works.

2.3 Where such special conditions of contract are in conflict with these general conditions, the special conditions shall apply.
### GENERAL CONDITIONS

<table>
<thead>
<tr>
<th>GCC3</th>
<th>General</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Unless otherwise indicated in the bidding documents, the purchaser shall not be liable for any expense incurred in the preparation and submission of a bid. Where applicable a non-refundable fee for documents may be charged.</td>
</tr>
<tr>
<td>3.2</td>
<td>With certain exceptions (National Treasury’s eTender website), invitations to bid are only published in the Government Tender Bulletin. The Government Tender Bulletin may be obtained directly from the Government Printer, Private Bag X85, Pretoria 0001, or accessed electronically from <a href="http://www.treasury.gov.za">www.treasury.gov.za</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GCC4</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>The goods supplied shall conform to the standards mentioned in the bidding documents and specifications.</td>
</tr>
</tbody>
</table>

| SCC4       | No additional standards required.                 |

<table>
<thead>
<tr>
<th>GCC5</th>
<th>Use of contract documents and information</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>The supplier shall not disclose, without the purchaser’s prior written consent, the contract, or any provision thereof, or any specification, plan, drawing, pattern, sample, or information furnished by or on behalf of the purchaser in connection therewith, to any person other than a person employed by the supplier in the performance of the contract. Disclosure made to any such employed person is in confidence and shall extend only as far as may be necessary for purposes of such performance.</td>
</tr>
<tr>
<td>5.2</td>
<td>The supplier shall not make, without the purchaser’s prior written consent, use of any document or information mentioned in GCC clause 5.1 except for purposes of performing the contract.</td>
</tr>
<tr>
<td>5.3</td>
<td>Any document, other than the contract itself mentioned in GCC clause 5.1 shall remain the property of the purchaser and shall be returned (all copies) to the purchaser on completion of the supplier’s performance under the contract if so required by the purchaser.</td>
</tr>
<tr>
<td>5.4</td>
<td>The supplier shall permit the purchaser to inspect the supplier’s records relating to the performance of the supplier and to have them audited by auditors appointed by the purchaser, if so required by the purchaser.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SCC5A</th>
<th>Copyright and Intellectual Property</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intellectual property are creations of the mind, such as inventions; literary and artistic works; designs; and symbols, names, images used in commerce; and includes copyright (a legal term describing the rights that creators have over their literary and artistic works including books, music, paintings, sculpture and films, to computer programs, databases, advertisements, maps and technical drawings); trademark (a legal term describing a sign capable of distinguishing the goods or services of one enterprise from those of other enterprises); and patents (a legal terms describing an exclusive right granted for an invention providing the patent owner with the right to decide how - or whether - the invention can be used by others).</td>
<td></td>
</tr>
<tr>
<td>Background intellectual property is the intellectual property pertaining to this contract, created, and owned by any of the contracted parties to this contract prior to the effective date of this contract.</td>
<td></td>
</tr>
</tbody>
</table>
| Contract intellectual property is the intellectual property created by the parties to this contract for and
GENERAL CONDITIONS

in the execution of the contract.

All background intellectual property (existing prior to this contract) invests in and remains the sole property of the contracted parties to this contract. Both parties disclose openly such intellectual property ownership to the parties in writing at the commencement of this contract.

The contracted supplier/party grants the National Research Foundation a fully paid up, irrevocable, and non-exclusive licence to use its background intellectual property for the exploitation of this contract to enable the National Research Foundation to obtain the full benefit of the contracted deliverables for this contract.

The parties agree that all right, title, and interest in contract intellectual property created during the execution of this contract invests with the National Research Foundation unless where agreed in writing to a different allocation of the ownership of the contract intellectual property as set out in the below special condition (SCC 5B).

Both parties to this contract shall keep the intellectual property created during this contract confidential and shall fulfil its confidentiality obligations as set out in this document.

The contracted supplier/party agrees to assist the National Research Foundation in obtaining statutory protection for the contract intellectual property at the expense of the National Research Foundation wherever the National Research Foundation may choose to obtain such statutory protection.

The contracted supplier/party shall procure where necessary the signatures of its personnel for the assignment of its respective contract intellectual property to the National Research Foundation or as the National Research Foundation may direct, and to support the National Research Foundation or its nominee, in the prosecution and enforcement thereof in any country in the world.

The contracted supplier/party irrevocably appoints the National Research Foundation to be its true and lawful agent in its own name, to do such acts, deeds, and things and to execute deeds, documents, and forms that the National Research Foundation in its discretion requires in order to give effect to the terms of this clause.

SCC5B

Confidentiality

The recipient of confidential information shall be careful and diligent as not to cause any unauthorised disclosure or use of the confidential information, in particular, during its involvement with the National Research Foundation and after termination of its involvement with the National Research Foundation, the recipient shall not:

a. Disclose the confidential information, directly or indirectly, to any person or entity, without the National Research Foundation’s prior written consent.

b. Use, exploit or in any other manner whatsoever apply the confidential information for any other purpose whatsoever, other than for the execution of the contract and the delivery of the deliverables or

c. Copy, reproduce, or otherwise publish confidentiality information except as strictly required for the execution of the contract.

The recipient shall ensure that any employees, agents, directors, contractors, service providers, and associates which may gain access to the confidential information are bound by agreement with the recipient both during the term of their associations with the recipient and after termination of their
## GENERAL CONDITIONS

The undertakings set out in this clause shall not apply to confidential information, which the recipient is able to prove:

- Was independently developed by the recipient prior to its involvement with the National Research Foundation or in the possession of the recipient prior to its involvement with the National Research Foundation;
- Is now or hereafter comes into the public domain other than by breach of this contract by the recipient;
- Was lawfully received by the recipient from a third party acting in good faith having a right of further disclosure and who do not derive the same directly or indirectly from the National Research Foundation, or
- Required by law to be disclosed by the recipient, but only to the extent of such order and the recipient shall inform the National Research Foundation of such requirement prior to any disclosure.

The recipient shall within one (1) month of receipt of a written request from the NRF to do so, return to the National Research Foundation all material embodiments, whether in documentary or electronic form, of the confidential information including but not limited to:

- All written disclosures received from the NRF;
- All written transcripts of confidential information disclosed verbally by the National Research Foundation; and
- All material embodiments of the contract intellectual property.

The recipient acknowledges that the confidential information made available solely for the execution of the contract and for no other purpose whatsoever and that the confidential information would not have been made available to the recipient, but for the obligations of confidentiality agreed to herein.

Except as expressly herein provided, this contract shall not be construed as granting or confirming, either expressly or impliedly any rights, licences or relationships by furnishing of confidential information by either party pursuant to this contract.

The recipient acknowledges that the unauthorised disclosure of confidential information may cause harm to the NRF. The recipient agrees that, in the event of a breach or threatened breach of confidentiality, the NRF is entitled to seek injunctive relief or specific performance, in order to obtain immediate remedies. Any such remedy shall be in addition to and not in lieu of any other remedies available at law, including monetary damages.

### SCC5C

Protection of Private Information

The supplier hereby gives the NRF permission, in terms of the Protection of Private Information Act 4 of 2013, to process, collect, receive, record, organise, collate, store, update, modify, retrieve, alter,
**GENERAL CONDITIONS**

<table>
<thead>
<tr>
<th>GCC6 Patent rights</th>
<th>6.1 The supplier shall indemnify the purchaser against all third-party claims of infringement of patent, trademark, or industrial design rights arising from use of the goods or any part thereof by the purchaser.</th>
</tr>
</thead>
<tbody>
<tr>
<td>GCC7 Performance security</td>
<td>7.1 Within thirty days (30) of receipt of the notification of contract award, the successful bidder shall furnish to the purchaser the performance security of the amount specified in SCC.</td>
</tr>
<tr>
<td></td>
<td>7.2 The proceeds of the performance security shall be payable to the purchaser as compensation for any loss resulting from the supplier's failure to complete his obligations under the contract.</td>
</tr>
<tr>
<td></td>
<td>7.3 The performance security shall be denominated in the currency of the contract, or in a freely convertible currency acceptable to the purchaser and shall be in one of the following forms:</td>
</tr>
<tr>
<td></td>
<td>7.3.1 bank guarantee or an irrevocable letter of credit issued by a reputable bank located in the purchaser's country or abroad, acceptable to the purchaser, in the form provided in the bidding documents or another form acceptable to the purchaser; or</td>
</tr>
<tr>
<td></td>
<td>7.3.2 a cashier's or certified cheque.</td>
</tr>
<tr>
<td></td>
<td>7.4 The performance security will be discharged by the purchaser and returned to the supplier within thirty (30) days following the date of completion of the supplier's performance obligations under the contract, including any warranty obligations, unless otherwise specified in SCC.</td>
</tr>
<tr>
<td>SCC7A</td>
<td>See performance security under EXECUTION/DELIVERY CONDITIONS</td>
</tr>
<tr>
<td>GCC8 Inspections, tests and analyses</td>
<td>8.1 All pre-bidding testing will be for the account of the bidder.</td>
</tr>
<tr>
<td></td>
<td>8.2 If it is a bid condition that supplies to be produced or services to be rendered should at any stage during production or execution or on completion be subject to inspection, the premises of the bidder or contractor shall be open, at all reasonable hours, for inspection by a representative of the purchaser or an organization acting on behalf of the purchaser.</td>
</tr>
<tr>
<td></td>
<td>8.3 If there are no inspection requirements indicated in the bidding documents and contract makes no mention, but during the contract period, it is decided that inspections shall be carried out, the purchaser shall itself make the necessary arrangements, including payment arrangements with the testing authority concerned.</td>
</tr>
<tr>
<td></td>
<td>8.4 If the inspections, tests and analyses referred to in clauses 8.2 and 8.3 show the supplies to be in accordance with the contract requirements, the cost of the inspections, tests and analyses shall be defrayed by the purchaser.</td>
</tr>
<tr>
<td></td>
<td>8.5 Where the supplies or services referred to in clauses 8.2 and 8.3 do not comply with the contract requirements, irrespective of whether such supplies or services are accepted or not, the supplier shall defray the cost in connection with these inspections, tests, or analyses.</td>
</tr>
<tr>
<td></td>
<td>8.6 Supplies and services referred to in clauses 8.2 and 8.3 and which do not comply with the contract...</td>
</tr>
</tbody>
</table>
## GENERAL CONDITIONS

**8.7** Any contract supplies may on or after delivery be inspected, tested or analysed and may be rejected if found not to comply with the requirements of the contract. Such rejected supplies are held at the cost and risk of the supplier who shall, when called upon, remove them immediately at his own cost and forthwith substitute them with supplies, which do comply with the requirements of the contract. Failing such removal the rejected supplies shall be returned at the suppliers cost and risk. Should the supplier fail to provide the substitute supplies forthwith, the purchaser may, without giving the supplier further opportunity to substitute the rejected supplies, purchase such supplies as may be necessary at the expense of the supplier.

8.8 The provisions of clauses 8.4 to 8.7 shall not prejudice the right of the purchaser to cancel the contract because of a breach of the conditions thereof, or to act in terms of Clause 23 of GCC.

### SCC8 Hand over of installation is after testing by Contractor, the NRF’s Aent/Engineer, NRF ICT, and NRF Building maintenance

### GCC9 Packing

9.1 The supplier shall provide such packing of the goods as is required to prevent their damage or deterioration during transit to their final destination, as indicated in the contract. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt, and precipitation during transit, and open storage. Packing, case size and weights shall take into consideration, where appropriate, the remoteness of the goods’ final destination and the absence of heavy handling facilities at all points in transit.

9.2 The packing, marking, and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the contract, including additional requirements, if any, specified in SCC, and in any subsequent instructions ordered by the purchaser.

### GCC10 Delivery and Documentation

10.1 The supplier in accordance with the terms specified in the contract shall make delivery of the goods/services. The SCC specifies the details of shipping and/or other documents furnished by the supplier.

10.2 Documents submitted by the supplier specified in SCC.

### GCC11 Insurance

11.1 The goods supplied under the contract are fully insured in a freely convertible currency against loss or damage incidental to manufacture or acquisition, transportation, storage and delivery in the manner specified in the SCC.

### SCC11A See performance security under EXECUTION/DELIVERY CONDITIONS

### SCC11B NRF assets in custody of the contractor are insured for the value of the replacement value of the asset.

### GCC12 Transportation

12.1 Should a price other than an all-inclusive delivered price be required, this shall be specified in the SCC.

### GCC13 Incidental services
### GENERAL CONDITIONS

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.1</td>
<td>The supplier may be required to provide any or all of the following services, including additional services, if any, specified in SCC:</td>
</tr>
<tr>
<td>13.1.1</td>
<td>Performance or supervision of on-site assembly and/or commissioning of the supplied goods;</td>
</tr>
<tr>
<td>13.1.2</td>
<td>Furnishing of tools required for assembly and/or maintenance of the supplied goods;</td>
</tr>
<tr>
<td>13.1.3</td>
<td>Furnishing of a detailed operations and maintenance manual for each appropriate unit of the supplied goods;</td>
</tr>
<tr>
<td>13.1.4</td>
<td>Performance or supervision or maintenance and/or repair of the supplied goods, for a period of time agreed by the parties, provided that this service shall not relieve the supplier of any warranty obligations under this contract; and</td>
</tr>
<tr>
<td>13.1.5</td>
<td>Training of the purchaser’s personnel, at the supplier’s plant and/or on-site, conducted in assembly, start-up, operation, maintenance, and/or repair of the supplied goods.</td>
</tr>
<tr>
<td>13.2</td>
<td>Prices charged by the supplier for incidental services, if not included in the contract price for the goods, shall be agreed upon in advance by the parties and shall not exceed the prevailing rates charged to other parties by the supplier for similar services.</td>
</tr>
<tr>
<td>SCC13A</td>
<td>In the event that this section is invoked it is only valid if confirmed through the issue of a written purchase order that specifies quantity, description, unit price, and delivery date as a minimum.</td>
</tr>
<tr>
<td>SCC13B</td>
<td>Incidental Services in addition to that stated in 13.1.4 and 13.1.5 are:</td>
</tr>
<tr>
<td></td>
<td>- Supply of consumables</td>
</tr>
<tr>
<td></td>
<td>- Supply of replacement parts</td>
</tr>
<tr>
<td></td>
<td>- Supply of spare parts</td>
</tr>
<tr>
<td></td>
<td>- Additional maintenance work flowing from operational requirements unforeseen at the issue of this bid enabling the back-up power system to supply immediate power when the data centre loses Eskom power.</td>
</tr>
<tr>
<td>GCC14</td>
<td>Spare parts</td>
</tr>
<tr>
<td>14.1</td>
<td>As specified in SCC, the supplier may be required to provide any or all of the following materials, notifications, and information pertaining to spare parts manufactured or distributed by the supplier:</td>
</tr>
<tr>
<td>14.1.1</td>
<td>Such spare parts as the purchaser may elect to purchase from the supplier, provided that this election shall not relieve the supplier of any warranty obligations under the contract; and</td>
</tr>
<tr>
<td>14.1.2</td>
<td>In the event of termination of production of the spare parts:</td>
</tr>
<tr>
<td>14.1.2.1</td>
<td>Advance notification to the purchaser of the pending termination, in sufficient time to permit the purchaser to procure needed requirements; and</td>
</tr>
<tr>
<td>14.1.2.2</td>
<td>Following such termination, furnishing at no cost to the purchaser, the blueprints, drawings, and specifications of the spare parts, if requested.</td>
</tr>
<tr>
<td>SCC14A</td>
<td>Spare parts including replacement components, parts of any of the systems of the back-up plant, spares, consumables, sub-systems, firmware, software, circuit boards, and replacements resulting from technology refreshment rates including all forms of upgrades.</td>
</tr>
<tr>
<td></td>
<td>Prices for spare parts charged by supplier not included in this contract’s initial price schedule (SBD 3.1)</td>
</tr>
</tbody>
</table>
**GENERAL CONDITIONS**

shall be agreed in advance by the parties and shall not exceed the prevailing rates charged to other parties by the supplier for these spares.

The NRF, upon agreement, confirms through the issue of a written purchase order that specifies quantity, delivery date, description, unit price, and delivery date as a minimum.

<table>
<thead>
<tr>
<th>GCC15</th>
<th>Warranty</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.1</td>
<td>The supplier warrants that the goods supplied under the contract are new, unused, of the most recent or current models and those they incorporate all recent improvements in design and materials unless provided otherwise in the contract. The supplier further warrants that all goods supplied under this contract shall have no defect, arising from design, materials, or workmanship (except when the design and/or material is required by the purchaser’s specifications) or from any act or omission of the supplier, that may develop under normal use of the supplied goods in the conditions prevailing in the country of final destination.</td>
</tr>
<tr>
<td>15.2</td>
<td>This warranty shall remain valid for twelve (12) months after the goods, or any portion thereof as the case may be, have been delivered to and accepted at the final destination indicated in the contract, or for eighteen (18) months after the date of shipment from the port or place of loading in the source country, whichever period concludes earlier, unless specified otherwise in SCC.</td>
</tr>
<tr>
<td>15.3</td>
<td>The purchaser shall promptly notify the supplier in writing of any claims arising under this warranty.</td>
</tr>
<tr>
<td>15.4</td>
<td>Upon receipt of such notice, the supplier shall, within the period specified in SCC and with all reasonable speed, repair or replace the defective goods or parts thereof, without costs to the purchaser.</td>
</tr>
<tr>
<td>15.5</td>
<td>If the supplier, having been notified, fails to remedy the defect(s) within the period specified in SCC, the purchaser may proceed to take such remedial action as may be necessary, at the supplier's risk and expense and without prejudice to any other rights, which the purchaser may have against the supplier under the contract.</td>
</tr>
</tbody>
</table>

**SCC15A** The warranty period in Clause 15.2 for delivery or performance that has been accepted by the NRF at the final destination indicated in the contract shall not read twelve (12) months, or eighteen (18) months after the date of shipment from the port or place of loading in the source country, rather shall read as five years or, five and half years respectively.

**GCC16** Payment

| 16.1  | The method and conditions of payment to be made to the supplier under this contract shall be specified in SCC. |
| 16.2  | The supplier shall furnish the purchaser with an invoice accompanied by a copy of the delivery note and upon fulfilment of other obligations stipulated in the contract. |

**SCC16.1A** The NRF's method of payment is electronic funds transfer after all conditions of Clause 16 are met.

| SCC16.2A | Clause 16.2 the term “copy of the delivery note and upon fulfilment of other obligations stipulated in the contract” is met by a NRF agreed signed proof of performance/delivery stating acceptance of quantity, acceptance to specification, and unit pricing in agreement with the contract and any purchase orders issued in terms of the contract. |
| 16.3  | Payments shall be made promptly by the purchaser, but in no case later than thirty (30) days after |
GENERAL CONDITIONS

submission of an invoice or claim by the supplier.

16.4 Payment will be made in Rand unless otherwise stipulated in SCC.

SCC16.3A The period in 16.3 applies from the date of receipt of an invoice, meeting the requirements of Clause 16.2 read with Clause SCC16.2A

GCC17 Prices

17.1 Prices charged by the supplier for goods delivered and services performed under the contract shall not vary from the prices quoted by the supplier in his bid, with the exception of any price adjustments authorized in SCC or in the purchaser’s request for bid validity extension, as the case may be.

SCC17 Exceptions to the above clause are incidental services, changes in Value Added Tax as gazetted, and spare parts.

GCC18 Contract amendment

18.1 No variation in or modification of the terms of the contract shall be made except by written amendment signed by the parties concerned.

GCC19 Assignment

19.1 The supplier shall not assign, in whole or in part, its obligations to perform under the contract, except with the purchaser’s prior written consent.

GCC20 Subcontract

20.1 The supplier shall notify the purchaser in writing of all subcontracts awarded under this contract if not already specified in the bid. Such notification, in the original bid or later, shall not relieve the supplier from any liability or obligation under the contract.

SCC20 Any sub-contract to another party complies with the requirements of the Preferential Procurement Policy Framework Act and its regulations.

GCC21 Delays in supplier’s performance

21.1 Delivery of the goods and performance of services shall be made by the supplier in accordance with the time schedule prescribed by the purchaser in the contract.

21.2 If at any time during performance of the contract, the supplier or its subcontractor(s) should encounter conditions impeding timely delivery of the goods and performance of services, the supplier shall promptly notify the purchaser in writing of the fact of the delay, its likely duration, and its cause(s). As soon as practicable after receipt of the supplier’s notice, the purchaser shall evaluate the situation and may at his discretion extend the supplier’s time for performance, with or without the imposition of penalties, in which case the extension shall be ratified by the parties by amendment of contract.

21.3 No provision in a contract shall be deemed to prohibit the obtaining of supplies or services from a national department, provincial department, or a local authority.

21.4 The right is reserved to procure outside of the contract small quantities or to have minor essential services executed if an emergency arises, the supplier’s point of supply is not situated at or near the place where the supplies are required, or the supplier’s services are not readily available.

21.5 Except as provided under GCC Clause 25, a delay by the supplier in the performance of its delivery...
GENERAL CONDITIONS

obligations shall render the supplier liable to the imposition of penalties, pursuant to GCC Clause 22, unless an extension of time is agreed upon pursuant to GCC Clause 21.2 without the application of penalties.

21.6 Upon any delay beyond the delivery period in the case of a supplies contract, the purchaser shall, without cancelling the contract, be entitled to purchase supplies of a similar quality and up to the same quantity in substitution of the goods not supplied in conformity with the contract and to return any goods delivered later at the supplier’s expense and risk, or to cancel the contract and buy such goods as may be required to complete the contract and without prejudice to his other rights, be entitled to claim damages from the supplier.

GCC22 Penalties

22.1 Subject to GCC Clause 25, if the supplier fails to deliver any or all of the goods or to perform the services within the period(s) specified in the contract, the purchaser shall, without prejudice to its other remedies under the contract, deduct from the contract price, as a penalty, a sum calculated on the delivered price of the delayed goods or unperformed services using the current prime interest rate calculated for each day of the delay until actual delivery or performance. The purchaser may also consider termination of the contract pursuant to GCC Clause 23.

GCC23 Termination for default

23.1 The purchaser, without prejudice to any other remedy for breach of contract, by written notice of default sent to the supplier, may terminate this contract in whole or in part:

23.1.1 If the supplier fails to deliver any or all of the goods within the period(s) specified in the contract, or within any extension thereof granted by the purchaser pursuant to GCC Clause 21.2;

23.1.2 If the Supplier fails to perform any other obligation(s) under the contract; or

23.1.3 If the supplier, in the judgment of the purchaser, has engaged in corrupt or fraudulent practices in competing for or in executing the contract.

23.2 In the event the purchaser terminates the contract in whole or in part, the purchaser may procure, upon such terms and in such manner as it deems appropriate, goods, works or services similar to those undelivered, and the supplier shall be liable to the purchaser for any excess costs for such similar goods, works or services. However, the supplier shall continue performance of the contract to the extent not terminated.

SCC23.2A In the event of the non-performance as per the agreed contract, the purchaser (NRF) will appoint an alternative service provider/supplier at the cost of the contracted service provider/supplier. The defaulting service provider/supplier is obliged to settle the damages/additional costs that the purchaser has incurred as result of the non-performance of the contracted service provider/supplier.

23.3 Where the purchaser terminates the contract in whole or in part, the purchaser may decide to impose a restriction penalty on the supplier by prohibiting such supplier from doing business with the public sector for a period not exceeding 10 years.

23.4 If a purchaser intends imposing a restriction on a supplier or any person associated with the supplier, the supplier will be allowed a period of not more than fourteen (14) days to provide reasons why the envisaged restriction should not be imposed. Should the supplier fail to respond within the stipulated
### GENERAL CONDITIONS

<table>
<thead>
<tr>
<th>Clause</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>23.5</td>
<td>Any restriction imposed on any person by the Accounting Officer / Authority will, at the discretion of the Accounting Officer / Authority, also be applicable to any other enterprise or any partner, manager, director or other person who wholly or partly exercises or exercised or may exercise control over the enterprise of the first-mentioned person, and with which enterprise or person the first-mentioned person, is or was in the opinion of the Accounting Officer / Authority actively associated.</td>
</tr>
</tbody>
</table>
| 23.6   | If a restriction is imposed, the purchaser must, within five (5) working days of such imposition, furnish the National Treasury, with the following information:  
23.6.1 The name and address of the supplier and/or person restricted by the purchaser;  
23.6.2 The date of commencement of the restriction  
23.6.3 The period of restriction; and  
23.6.4 The reasons for the restriction.  
These details will be loaded in the National Treasury’s central database of suppliers or persons prohibited from doing business with the public sector. |
| 23.7   | If a court of law convicts a person of an offence as contemplated in sections 12 or 13 of the Prevention and Combating of Corrupt Activities Act, No. 12 of 2004, the court may also rule that such person’s name be endorsed on the Register for Tender Defaulters. When a person’s name has been endorsed on the Register, the person will be prohibited from doing business with the public sector for a period not less than five years and not more than 10 years. The National Treasury is empowered to determine the period of restriction and each case will be dealt with on its own merits. According to section 32 of the Act the Register must be open to the public. The Register can be perused on the National Treasury website. |

**GCC24**  
**Anti-dumping and countervailing duties and rights**

<table>
<thead>
<tr>
<th>Clause</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>24.1</td>
<td>When, after the date of bid, provisional payments are required, or anti-dumping or countervailing duties are imposed, or the amount of a provisional payment or anti-dumping or countervailing right is increased in respect of any dumped or subsidized import, the State is not liable for any amount so required or imposed, or for the amount of any such increase. When, after the said date, such a provisional payment is no longer required or any such anti-dumping or countervailing right is abolished, or where the amount of such provisional payment or any such right is reduced, any such favourable difference shall on demand be paid forthwith by the contractor to the State or the State may deduct such amounts from moneys (if any) which may otherwise be due to the contractor in regard to supplies or services which he delivered or rendered, or is to deliver or render in terms of the contract or any other contract or any other amount which may be due to him.</td>
</tr>
</tbody>
</table>

**GCC25**  
**Force Majeure**

<table>
<thead>
<tr>
<th>Clause</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>25.1</td>
<td>Notwithstanding the provisions of GCC Clauses 22 and 23, the supplier shall not be liable for forfeiture of its performance security, damages, or termination for default if and to the extent that his delay in performance or other failure to perform his obligations under the contract is the result of an event of force majeure.</td>
</tr>
</tbody>
</table>
## GENERAL CONDITIONS

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>25.2</td>
<td>If a force majeure situation arises, the supplier shall promptly notify the purchaser in writing of such condition and the cause thereof. Unless otherwise directed by the purchaser in writing, the supplier shall continue to perform its obligations under the contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the force majeure event.</td>
</tr>
<tr>
<td>GCC26</td>
<td><strong>Termination for insolvency</strong></td>
</tr>
<tr>
<td>26.1</td>
<td>The purchaser may at any time terminate the contract by giving written notice to the supplier if the supplier becomes bankrupt or otherwise insolvent. In this event, termination will be without compensation to the supplier, provided that such termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to the purchaser.</td>
</tr>
<tr>
<td>GCC27</td>
<td><strong>Settlement of disputes</strong></td>
</tr>
<tr>
<td>27.1</td>
<td>If any dispute or difference of any kind whatsoever arises between the purchaser and the supplier in connection with or arising out of the contract, the parties shall make every effort to resolve amicably such dispute or difference by mutual consultation.</td>
</tr>
<tr>
<td>27.2</td>
<td>If, after thirty (30) days, the parties have failed to resolve their dispute or difference by such mutual consultation, then either the purchaser or the supplier may give notice to the other party of his intention to commence with mediation. No mediation in respect of this matter may be commenced unless such notice is given to the other party.</td>
</tr>
<tr>
<td>27.3</td>
<td>Should it not be possible to settle a dispute by means of mediation, it may be settled in a South African court of law.</td>
</tr>
<tr>
<td>27.4</td>
<td>Mediation proceedings shall be conducted in accordance with the rules of procedure specified in the SCC.</td>
</tr>
<tr>
<td>27.5</td>
<td>Notwithstanding any reference to mediation and/or court proceedings herein,</td>
</tr>
<tr>
<td>27.5.1</td>
<td>The parties shall continue to perform their respective obligations under the contract unless they otherwise agree; and</td>
</tr>
<tr>
<td>27.5.2</td>
<td>The purchaser shall pay the supplier any monies due the supplier.</td>
</tr>
<tr>
<td>GCC28</td>
<td><strong>Limitation of liability</strong></td>
</tr>
<tr>
<td>28.1</td>
<td>Except in cases of criminal negligence or wilful misconduct, and in the case of infringement pursuant to Clause 6;</td>
</tr>
<tr>
<td>28.1.1</td>
<td>The supplier shall not be liable to the purchaser, whether in contract, tort, or otherwise, for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided that this exclusion shall not apply to any obligation of the supplier to pay penalties and/or damages to the purchaser; and</td>
</tr>
<tr>
<td>28.1.2</td>
<td>The aggregate liability of the supplier to the purchaser, whether under the contract, in tort or otherwise, shall not exceed the total contract price, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment.</td>
</tr>
<tr>
<td>GCC29</td>
<td><strong>Governing language</strong></td>
</tr>
</tbody>
</table>
| 29.1    | The contract shall be written in English. All correspondence and other documents pertaining to the
### GENERAL CONDITIONS

**contract that is exchanged by the parties shall also be written in English.**

<table>
<thead>
<tr>
<th>GCC30</th>
<th>Applicable law</th>
</tr>
</thead>
<tbody>
<tr>
<td>30.1</td>
<td>The contract shall be interpreted in accordance with South African laws, unless otherwise specified in SCC.</td>
</tr>
</tbody>
</table>

| SCC30.1A | Other legal systems are not applicable. |

<table>
<thead>
<tr>
<th>GCC31</th>
<th>Notices</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.1</td>
<td>Every written acceptance of a bid shall be posted to the supplier concerned by registered or certified mail and any other notice to him shall be posted by ordinary mail to the address furnished in his bid or to the address notified later by him in writing and such posting shall be deemed to be proper service of such notice.</td>
</tr>
</tbody>
</table>

| SCC31 | Electronic communication, to the extent it meets the requirements of legal notices and the requirements of the electronic communication laws, is permitted. |

<table>
<thead>
<tr>
<th>GCC32</th>
<th>Taxes and duties</th>
</tr>
</thead>
<tbody>
<tr>
<td>32.1</td>
<td>A foreign supplier shall be entirely responsible for all taxes, stamp duties, license fees, and other such levies imposed outside the purchaser’s country.</td>
</tr>
</tbody>
</table>

| 32.2  | A local supplier shall be entirely responsible for all taxes, duties, license fees, etc., incurred until delivery of the contracted goods to the purchaser. |

| 32.3  | No contract shall be concluded with any bidder whose tax matters are not in order. Prior to the award of a bid, the Department must be in possession of a tax clearance certificate, submitted by the bidder. This certificate must be an original issued by the South African Revenue Services |

| SCC32A | The “tax certificate” in clause 32.3’s second sentence refers to the documents specified in National Treasury Instruction Note 9 of 2017/18 applicable to public entities and departments. |

<table>
<thead>
<tr>
<th>GCC33</th>
<th>National Industrial Participation Programme</th>
</tr>
</thead>
<tbody>
<tr>
<td>33.1</td>
<td>The NIP Programme administered by the Department of Trade and Industry shall be applicable to all contracts that are subject to the NIP obligation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GCC34</th>
<th>Prohibition of restrictive practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>34.1</td>
<td>In terms of section 4 (1) (b) (iii) of the Competition Act No. 89 of 1998, as amended, an agreement between, or concerted practice by, firms, or a decision by an association of firms, is prohibited if it is between parties in a horizontal relationship and if a bidder (s) is / are or a contractor(s) was / were involved in collusive bidding (or bid rigging).</td>
</tr>
</tbody>
</table>

| 34.2  | If a bidder(s) or contractor(s), based on reasonable grounds or evidence obtained by the purchaser, has/have engaged in the restrictive practice referred to above, the purchaser may refer the matter to the Competition Commission for investigation and possible imposition of administrative penalties as contemplated in the Competition Act No. 89 of 1998. |

| 34.3  | If a bidder(s) or contractor(s), has / have been found guilty by the Competition Commission of the |
**GENERAL CONDITIONS**

restrictive practice referred to above, the purchaser may, in addition and without prejudice to any other remedy provided for, invalidate the bid(s) for such item(s) offered, and / or terminate the contract in whole or part, and / or restrict the bidder(s) or contractor(s) from conducting business with the public sector for a period not exceeding ten (10) years and / or claim damages from the bidder(s) or contractor(s) concerned.

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### BID CONTRACT SUBMISSION CERTIFICATE

I hereby undertake to supply all or any of the goods, works, and services described in this procurement invitation to the NRF in accordance with the requirements and specifications stipulated in this Bid Invitation document at the price/s quoted.

My offer remains binding upon me and open for acceptance by the NRF during the validity period indicated and calculated from the closing time of Bid Invitation.

The following documents are deemed to form and be read and construed as part of this offer / bid even where integrated in this document:

- Invitation to Bid (SBD 1)
- Bid Contract including the following sections:
  - Specification(s) as set out in the respective section in the bid contract;
  - Annexures to the bid contract;
  - Bidders responses to this Bid Invitation and bid contract;
  - Price schedule (SBD 3);
  - Preference (SBD 6.1) claims for Broad Based Black Economic Empowerment Status Level of Contribution in terms of the Preferential Procurement Regulations 2017, supported by a valid certified BBBEE certificate;
  - Local Content and Local Manufacturing Certification (SBD 6.2) in accordance with the SABS standard where applicable;
  - Declaration of Interest (SBD4);
  - Independent Price Determination (SBD 9);
  - Declaration of Bidder’s past SCM practice (SBD 8); and
  - Contract conditions

I confirm that I have satisfied myself as to the correctness and validity of my offer/bid in response to this Bid Invitation; that the price(s) and rate(s) quoted cover all the goods, works and services specified in the Bid Invitation and cover all my obligations and I accept that any mistakes regarding price(s) and rate(s) and calculations will be at my own risk.

I accept full responsibility for the proper execution and fulfilment of all obligations and conditions devolving on me in terms of this Bid Invitation as the principal liable for the due fulfilment of the subsequent contract if awarded to me.

I declare that I have had no participation in any collusive practices with any Bidder or any other person regarding this or any other Bid.

I certify that the information furnished in these declarations (SBD 3, SBD 4, SBD 6.1, SBD 6.2, SBD 8, SBD 9) is
BID CONTRACT SUBMISSION CERTIFICATE

correct and I accept that the NRF may reject the Bid or act against me should these declarations prove to be false.

I confirm that I am duly authorised to sign this offer/ bid response.

| NAME (PRINT) |  |
| CAPACITY |  |
| SIGNATURE |  |
| WITNESS 1 |  |
| NAME |  |
| SIGNATURE |  |
| WITNESS 2 |  |
| NAME |  |
| SIGNATURE |  |
| DATE |  |