OIL INDIA LIMITED
(A Govt. of India Enterprise)
P.O. Duliajan – 786602, Assam

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Tender No. & Date : **SDG6341P15/09**

Tender Fee : INR 4,500.00 OR USD 100.00

Bid Security Amount : Applicable

Bidding Type : **SINGLE STAGE TWO BID SYSTEM**

Bid Closing on : 22.04.2015 (at 11.00 Hrs. IST)
Bid Opening on : 22.04.2015 (at 14.00 Hrs. IST)

Performance Guarantee : Applicable

OIL INDIA LIMITED invites Global Tenders for items detailed below:

Item No./Mat. Code	Material Description	QTY.	UOM
10	SUPPLY, INSTALLATION AND COMMISSIONING OF SILENT GAS ENGINE DRIVEN GENERATOR SET OF CAPACITY 500 KVA AS PER THE FOLLOWING ANNEXURE: a) Detailed specification – Annexure - I. b) Bid Rejection Criteria (BRC) and Bid Evaluation Criteria – Annexure - II. c) Technical & Commercial Check list vide Annexure - III	6	Nos.

Special Notes :

1.0 The tender will be governed by "General Terms & Conditions" for e-Procurement as per Booklet No. MM/GLOBAL/E-01/2005 for E-procurement (ICB Tenders) including Amendments & Addendum to "General Terms & Conditions" for e-Procurement.

2.0 Technical Check list and Commercial Check list are furnished vide Annexure – III. Please ensure that both the check lists are properly filled up and uploaded along with "Techno-commercial Unpriced Bid".

3.0 The items covered by this enquiry shall be used by Oil India Limited in the PEL/ML areas which are issued/renewed after 01/04/99 and hence Nil Customs Duty during import will be applicable. Indigenous bidder shall be eligible for Deemed Export Benefit against this purchase. Details of Deemed Export are furnished vide Addendum to "General Terms & Conditions". However, Indian bidders will not be issued Recommendatory Letter.

4.0 Please note that all tender forms and supporting documents are to be submitted through OIL's e-Procurement site only except following documents which are to be submitted manually in sealed envelope super scribed with **Tender no.** and **Due date** to The **Head Materials, Materials Department, Oil India Limited, Duliajan- 786602, Assam** on or before **13:00 Hrs (IST)** on the Bid Closing Date mentioned in the Tender.

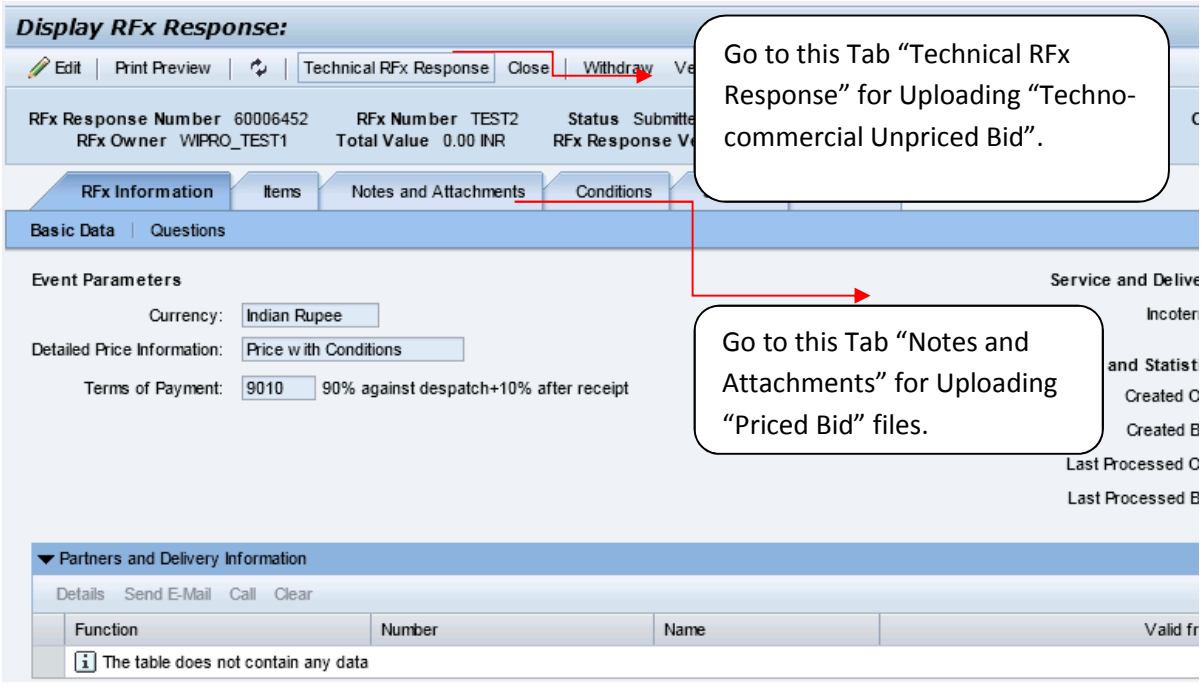
a) **Original Bid Security.**
b) **Details Catalogue and any other document which have been specified to be submitted in original.**

All documents submitted in physical form should be signed on all pages by the authorised signatory of the bidder and to be submitted in triplicate.

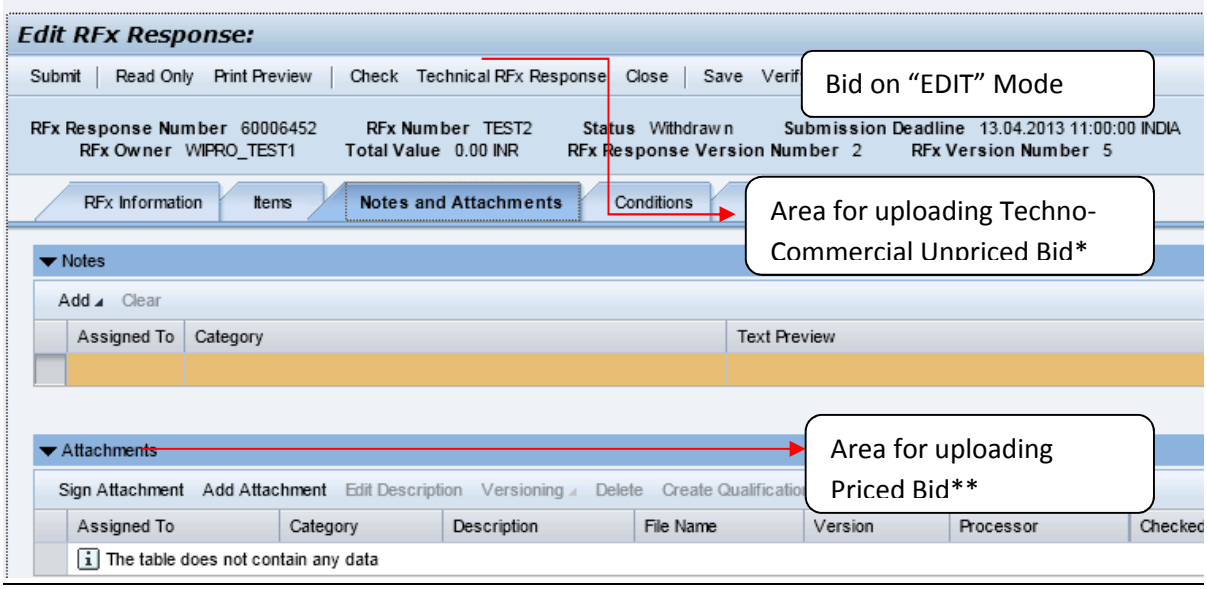
5.0 In case of SINGLE STAGE-TWO BID SYSTEM, bidders shall prepare the "Techno-commercial Unpriced Bid" and "Priced Bid" separately and shall upload through electronic form in the OIL's e-Tender portal within the Bid Closing Date and Time stipulated in the e-Tender. The "Techno-commercial Unpriced Bid" shall contain all technical and commercial details except the prices which shall be kept blank. Details of prices as per Bid format / Commercial bid to be uploaded as attachment in the Attachment Tab "Notes and Attachments".

A screen shot in this regard is given below.

Any offer not complying with above submission procedure will be rejected as per Bid Rejection Criteria mentioned in the tender.



On "EDIT" Mode- The following screen will appear. Bidders are advised to Upload "Techno-Commercial Unpriced Bid" and "Priced Bid" in the places as indicated above:



Note :

* The "Techno-Commercial Unpriced Bid" shall contain all techno-commercial details **except the prices**.

** The "Price bid" must contain the price schedule and the bidder's commercial terms and conditions. For uploading Price Bid, first click on Sign Attachment, a browser window will open, select the file from the PC and click on Sign to sign the Sign. On Signing a new file with extension .SSIG will be created. Close that window. Next click on Add Atachment, a browser window will open, select the .SSIG signed file from the PC and name the file under Description, Assigned to General Data and clock on OK to save the File.

6.0 Bidders are requested to examine all instructions, forms, terms and specifications in the bid. Failure to furnish all information required as per the bid or submission of offers not substantially responsive to the bid in every respect will be at the bidders risk and may result in the rejection of its offer without seeking any clarifications.

7.0 Other terms and conditions of the tender shall be as per "General Terms & Conditions" for e- Procurement as per Booklet No. MM/GLOBAL/E-01/2005 for E-procurement (ICB Tenders) and its amendments. However, if any of the Clauses of the Bid Rejection Criteria (BRC) / Bid Evaluation Criteria (BEC) mentioned here contradict the Clauses in the "General Terms & Conditions" for e-Procurement as per Booklet No. MM/GLOBAL/E-01/2005 for E-procurement

(ICB Tenders) of the tender and/or elsewhere, those mentioned in this BEC / BRC shall prevail.

8.0 The Integrity Pact is applicable against this tender. OIL shall be entering into an Integrity Pact with the bidders as per format enclosed vide Annexure XII of the tender document. This Integrity Pact proforma has been duly signed digitally by OIL's competent signatory. The proforma has to be returned by the bidder (along with the technical bid) duly signed (digitally) by the same signatory who signed the bid, i.e., who is duly authorized to sign the bid. Uploading the Integrity Pact with digital signature will be construed that all pages of the Integrity Pact has been signed by the bidder's authorized signatory who sign the Bid. **If any bidder refuses to sign Integrity Pact or declines to submit Integrity Pact with the offer, their bid shall be rejected straightway.**

OIL's Independent External Monitors at present are as under:

(I) SHRI RAGHAW SHARAN PANDEY, IAS (RETD.)
Former Secretary, Ministry of Petroleum & Natural Gas
E-MAIL ID : rspandey_99@yahoo.com

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ANNEXURE – I

SCOPE OF SUPPLY : SUPPLY, INSTALLATION AND COMMISSIONING OF SILENT GAS ENGINE DRIVEN GENERATOR SET OF CAPACITY 500KVA.

QUANTITY : 6 Nos.

1.0 SPECIFICATION

1.1 Supply of new natural gas engine-driven generator set of rating and output specified herein and housed inside weather proof acoustic enclosure. The generator set shall be complete with all accessories including control panel, safety devices and shall be mounted on oil-field skid for lifting and transportation.

1.2 The scope of work includes besides the supply, installation and commissioning of the Generator set at OIL's Site with field testing and reliability run/trial run or Run - in.

1.3 Rating and output of Generator Set: 500kVA (400kWe), 0.8PF (lag), 415V, AC, 50Hertz, Prime as per ISO8528 standard with 10% overload capacity.

2.0 GENERAL REQUIREMENTS FOR THE GENERATOR SETS

2.1 The generator set shall be sturdy, rugged, proven and extremely reliable and durable. The generator set shall be suitable for operation in oil and gas field installations with field gas from the oil and gas field, in single island mode operation (round the clock on rotation) and outdoor deployment.

2.2 Electrical loads shall be utilities, motors of 100HP and UPS of rating 5 - 7.5kVA.

2.3 The generator set shall be resistant to dirt in the air or fuel gas, tolerant of extremes of temperature, suited to frequent moves from site to site.

2.4 The components of the generator set complete shall be of such design so as to satisfactorily function under all conditions of operation.

2.5 The entire work of manufacture/fabrication, assembly and installation shall conform to sound engineering practice. The entire installation shall be such as to cause minimum transmission of noise and vibration to the site.

2.6 All equipment and materials to be used in work shall be manufactured in factories of good repute having excellent track record of quality manufacturing, performance and proper after sales service.

2.7 Vendor shall provide all related components and auxiliaries of generating set as part of the package

2.8 Vendor shall furnish all relevant data of complete package as per Section C (Data Sheet)

3.0 **CODES & STANDARDS**

3.1 All equipment in the offer shall conform to the following, but not limited to them, latest edition of relevant codes & standards.
3.2 ISO 3046/1 or equivalent Indian Standard: Specification for reciprocating internal combustion engines
3.3 ISO 8528 or equivalent Indian Standard: Rotating electrical machine
3.4 IS: 10000(Part-iv) (or) (ISO: 3046) (Latest edition): Declaration of power, efficiency, fuel (NG) and lube oil consumption for gas engine.
3.5 IS: 10002: Specification for performance requirement for constant Speed Engines (above 20 KW).
3.6 IS: 12065 Noise limit
3.7 IS: 13364 Specification of Alternator coupled with IC Engines
3.8 IS: 12075 Vibration
3.9 IS: 4691 Enclosure Protection
3.10 IS: 6362 Cooling
3.11 IS: 2253 Mounting
3.12 In case of bidder's inability to use the mentioned codes and standards, the bidder/manufacturer shall indicate his proposed codes and standards defining in detail for using the same. OIL may review the bidder's proposed codes and standards for approval of the same.

4.0 **SITE CONDITIONS**

4.1 The ambient condition of the generator sets shall be:
4.2 Maximum Ambient Temperature : 42°C
4.3 Minimum Ambient Temperature : 05°C
4.4 Maximum Humidity at 21°C : 100 %
4.5 Maximum Humidity at 35°C : 95 %
4.6 Maximum Humidity at 41°C : 70 %
4.7 Maximum Altitude above sea level: 150 Meter

5.0 **COMPOSITION OF FUEL GAS AT SITES**

5.1 The gas is sourced locally from the nearby oil field which is also sometimes known as "field gas" or "wellhead gas". The field gas composition (composition furnished here with) and quality can vary greatly from one location to another, and must be conditioned for use as well. Presence of natural gas liquids in the raw gas along with crude and other troublesome impurities is very common.
5.2 The composition of the gas is broadly as under:

CONSTITUTION Range by % VOLUME

a) Methane 85.7 - 93.52
b) Ethane 2.45 - 6.55

c) Propane 1.28 - 3.12
d) Nitrogen 0.53 - 1.21
e) Carbon-dioxide 0.01 - 0.57
f) Iso-Butane 0.31 - 0.75
g) N-Butane 0.4 - 1.14
h) Iso-Pentane 0.19 - 0.47
i) N-Pentane 0.17 - 0.38
j) Hexane 0.34 - 1.16
k) Gravity 0.6204 -0.6919
l) Gross Calorific Value 9636.8- 10590.8 Kcal/SCUM
m) Net Calorific Value 8704.3- 9595.4 Kcal/SCUM
n) Moisture content:21.0-120.0LB/MMCFT(336.0-1992.0 KG/MMSCM)

NOTE:

Though the given methane content is in the range of 85.7 - 93.52% by volume, the bidders shall consider while selecting engine and its configuration, methane content of field gas to be as low as 80% by volume and highly aggressive. The engine should work trouble free without knocking or pre- ignition and without having to de-rate on ground of gas quality. The field gas shall be fed through scrubber and at 20-30PSIG at upstream of gas train.

6.0 **TECHNICAL SPECIFICATION**

6.1 **GAS ENGINE AND GENERATOR SET RATING/CAPACITY**:

a) The engine-generator set, as a unit, shall be rated for a prime power application of 500kVA (400kWe), at 0.8-PF (lag) with an output of 696 amperes while generating 415 Volt AC, 3-phase, 50 Hz power, and the rated output shall be available at the generator output terminals with the given gas composition as engine fuel.

b) The generator set should also be capable to deliver 10 percent overload beyond its nameplate rating for one hour for every 12 hour of operation. Transient response with respect to block loading shall conform to ISO 8528 requirements and Single Step Block loading capacity shall not be less than 60% of the rated capacity.

c) Generator set should be ready to use type and suitable to operate on the given gas composition. It should be configured to accept aggressive raw natural gas/field gas or well head gas.

d) The generator drive-engine shall be standard design of the original manufacturer designed primarily for generator set application in accordance with

ISO 3046/BS5514/IS10000/ISO8528 standards and with high tolerance for variable quality of gaseous fuels (field gas).

e) The generator drive-engine shall be a four-stroke, spark-ignited, with heat exchanger-cooling tower cooling system, turbocharged after cooled, multi-cylinder V-configuration gas engine capable of meeting the rated output and duty of the generator set with 1500RPM as speed, compression ratio not exceeding 12:1 and power of the engine shall be in the range of 570 - 600 BHP gross. It should also be capable to operate without any external ventilation system and shall be configured to accept aggressive raw natural gas/field gas or well head gas.

f) The power density of the generator drive-engine shall not exceed 11kWe per litre of displacement volume and the average load factor of the gas engine driven generator set over 24 hour period shall not be less than 75% of prime power output.

g) The generator drive-engine shall be robust, durable with proven track record. It should be known for high reliability and durability, designed for most demanding applications in oilfield, low life cycle costs, simple start-up and installation, and high tolerance for gas fuel of variable quality.

Note:
The following documents, but not limited to them, shall be submitted along with the technical bid in support of the specified rating and output:

a) The technical data pertaining to the engine provided with the offer should be certified by the engine manufacturer.

b) Necessary certificate indicating the compliance of the capacity requirements given in clauses - 6.1(a) thro 6.1(g), for the engine model so selected should be furnished from the engine manufacturer.

c) Necessary certificate indicating the 24 hour average load factor and Time between Overhaul (TBO) for the engine for the specified output and duty from the engine/generator set manufacturer.

d) Engine BHP with natural gas calorific value 970BTU/CFT as engine fuel and at 1500RPM and 12:1 Compression Ratio or lower.

e) Calculation for determining the size of the engine generator set.

f) Engine and alternator should bear Name Plate revealing in it details of ratings published by the OEM of the engine and alternator. The details of ratings should match with the manufacturer's standard catalogue.

6.2 **ALTERNATOR AND CONTROL PANEL and other electrical items**:

(Refer **Section A** for Specification of Electrical Items)

Note:
The specification for electrical items in Section A shall have over -riding value and shall be followed for that particular item/work, wherever they differ from specifications given in other section/annexure.

7.0 **CONSTRUCTION FEATURES**

The specifications given hereunder are general in nature and shall be subject to the standard practice of the engine manufacturer. However, the ignition and governor with the engine shall be as per the given specification provided under in the respective subsection here under. Bidder / manufacturer shall be responsible for providing gas engine driven generating set as per standard practice with the specified technical requirements suitable for Prime Rated Power (PRP) Operation.

7.1 **GAS ENGINE**:

(i) STARTING SYSTEM - Electrical start complete with batteries (lead acid type). The engine starting system shall include 24 volt DC starting motor(s), starter relay, and automatic reset circuit breaker to protect against butt engagement. Batteries shall be maintenance free, lead acid type mounted near the starting motor. Corrosion resistant or coated steel battery rack shall be provided for mounting. Required cables will be furnished and sized to satisfy circuit requirements.

(ii) CHARGING SYSTEM - An engine mounted belt driven battery charging alternator shall be installed with an automatic voltage regulator. It shall be suitable for heavy duty applications with a rating of 12 volts. Battery racks with interconnecting leads and terminals.

(iii) AIR INTAKE SYSTEM - shall include dry type paper filters element, silencer and vacuum indicator for servicing air cleaner as per manufacturer standard. Maximum air intake restrictions with clean and choked filters should be within prescribed limit of the OEM/ manufacturer recommendation for the particular model of the engine. Air cleaners should be either medium or heavy as per manufacturer standard for gen set application.

(iv) LUBRICATION SYSTEM - forced feed pressure lubrication system with lubrication oil filters with replaceable elements as per manufacturer standard. Necessary gear driven oil pump for lubricating oil, oil coolers, priming of engine bearing as per manufacturer recommendations. The sump should have adequate capacity to continue operation up to 1000 Hrs. without Lub Oil Change.

(v) FUEL SYSTEM - fuel system shall comprise isolation valve, gas filter, gas pressure reducer, solenoid valves including gas purification plant of capacity

adequate for full load operation of the generator set besides other accessories etc. Gas shall be available at around 50 psig pressure at gas train inlet. Gas engine shall be suitable to operate at this pressure.

(vi) IGNITION SYSTEM

The ignition system shall be Altronic magneto type, consisting of Altronic III/V generator or its latest variant complete with ignition transformers, wiring harness, junction box, non shielded high tension conductors and spark plugs.

(vii) GOVERNOR - The governor shall be Woodward Hydraulic or electronic speed-sensing governor capable of isochronous frequency regulation from no load to full rated load. It shall control engine speed and transient load response within ISO 8528 tolerances. It will be selected, installed, and tested by the engine manufacturer.

Note: The engine speed shall be so maintained that frequency variation at constant load including no load shall remain within a band of 1% of rated frequency.

(viii) ENGINE EXHAUST SYSTEM

Exhaust system with smooth bends to create minimum back pressure, with suitable residential grade silencer (at optimum location) to reduce the noise level upto 75 dB and inbuilt Spark Arrestor. The silencer shall have an end inlet and end outlet with its horizontal tail end with 45 degree downward cut to avoid rain water entry or with rain cap vertical end. The exhaust flexible shall have it's free length when it is installed.

The exhaust shall be terminated above the building / enclosure. The termination height shall be calculated with following formula:

H = h + 0.2 x square root-over of kVA, where, H = Height of termination, h = height of Building / Enclosure

Exhaust piping shall be of MS pipe (Schedule B) conforming to relevant IS. The runs forming part of the factory assembly on the engine flexible connections upto the exhaust silencer shall be exclusive of exhaust piping item. 50mm thick loosely bound resin (LBR) mattress/mineral wool/Rockwool, density not less than 120kg/sq. meter and 0.6mm thick aluminium shall be used for cladding work. Load or stress should be prevented on the turbocharger.

(ix) NOISE and EMISSION COMPLIANCE:

Compliance of noise and emission norms as per latest CPCB guidelines for gas generator set should be furnished from the manufacturers along with the technical bid.

(x) COOLING SYSTEM - System should be designed for ambient temperature of 40 Deg.C. It should have heat Exchanger - Cooling Tower system for cooling.

(xi) ACCESSORIES: The engine shall be fitted with the following accessories subject to the design of the manufacturer:

a Engine over speed protection.
b Vibration dampers.
c Non sparking guard for coupling
d Dynamically balanced Flywheel
e Necessary flexible coupling and guard for alternator and engine

(xii) INSTRUMENTATION & CONTROLS: Engine shall be provided with the following instruments and controls for the efficient operation and safety. It shall be simple and easy to operate and maintain. All controls shall operate in fail- safe mode.

a Start/ Stop Switch
b Battery Charging Indication
c Lube oil pressure indication, alarm and shut down
d Low lub oil trip indication
e Water temperature indication
f High water temperature indication, alarm and shut down
g RPM indication
h Over-speed indication, alarm and shut down
i Engine hours indication

7.2 **ALTERNATOR AND CONTROL PANELS and other electrical items**.

i) (Refer **Section A** for specification of electrical items)

ii) Note: Engine & Alternator shall be supplied with independent lifting hooks / eye bolts for safe Handling

8.0 ACOUSTIC ENCLOSURE

(Refer **Section B** for specification of Acoustic enclosure, Enclosure Illumination and Enclosure Earthing Arrangement.)

9.0 ON LINE GAS MONITORING SYSTEM

Continuous On Line Gas Monitoring System, specified her under, shall be installed inside the Acoustic Enclosure.

i) Detector / Gas Sensor: Actual Nos of Sensors to be decided based on locations where there are possibilities of gas leakage inside the acoustic enclosure.

ii) Type : IR (Infrared), suitable for detection of NATURAL GAS (By Volume CH4 : 89.538 %, N2 : 1.004 %, CO2 : 0.543 %, C2H6 : 4.132 %, C3H8 : 2.491 %, Others : 2.292 %)

iii) Range: 0 to 100 % LEL

iv) Operating Temperature: 0 to 50 Deg C

v) Display: 4 digits LCD Display

vi) Alarm Setting: Variable

vii) Shut down setting: Variable

viii) Control system: Suitable control system to be provided for alarm and safety shut down of the engine

ix) Sensor calibration: Adjustment of Zero & Span on-site Non Intrusive one man calibration should have facility to calibrate the instrument on spot without disconnecting from power supply by using any portable hand held intrinsically safe calibrator.

x) Detectors must be suitable for hazardous environment i.e., Zone 1 & Zone 2 hazardous area as per OMR, 1984.

xi) Approval for Detectors / Sensors: Valid DGMS approval certificate must be provided with the offer.

10.0 **SKID**

Engine and Alternator shall be directly coupled or coupled by means of flexoplate/flexible coupling as per manufacturer standard design and both units shall be mounted on a suitable designed common bed plate together with all auxiliaries to ensure perfect alignment of engine and alternator with minimum vibrations. The bed plate shall be suitable for installation on suitable anti-vibration mounting system.

The bidder is advised to note that the generator set has to move fairly frequently from location to location thereby prone to abuse of transportation. The skid/base should be designed to help protect against damage and misalignment that could result while the unit is being moved. It should be such that it should help to isolate the generator set from impact loads that occur during movement and from distortions of the skid/base resulting from rough handling, protecting the generator driveline and its alignment.

11.0 **PAINTING & PACKING**

i) Painting shall be done as per standard practice of manufacturer.

ii) The packing shall be roadworthy for transportation upto site, sufficiently robust to withstand rough handling.

iii) Boxes/packing cases containing electrical equipment shall be water proof lined.

iv) All the matters on the control panel should be packed separately for mounting at site or mounted in such a manner to prevent transit damage

v) All manuals, books, digital items (discs) shall be separately packed and contained in rigid plastic pouches.

vi) All manuals, drawings, documents and digital items of engine shall be packed in one separate container and the container shall be separately handed over to OIL at delivery of the Gen sets.

12.0 **EQUIPMENT DATA SHEET AND NAME PLATE**

(i) EQUIPMENT DATA SHEET

(Refer **Section C** for details of data sought)

(ii) NAME PLATE

The following data shall be engraved on the name plate:

(iii) Gas Engine:

Manufacture's Name, Model, Sl. No. & Year of Manufacture, Rated BHP, Rated RPM, Weight In Kg., OIL's Purchase Order No.

(iv) Alternator:

Manufacturer's Name, Sl. No: Type & Frame Ref, Rated Output in kVA & kW, Type of Duty, Rated Power Factor, Frequency, Rated Voltage, No: of Phases & Type of Connection, Rated Speed (RPM), Class of Insulation, Excitation Current & Voltage at Rated Out Put, Year of Manufacture &, Weight in Kg., OIL's Purchase Order No.

13.0 **PARTS FOR TWO YEAR OPERATION AND MAINTENANCE**:

Spare parts required for two year operation and maintenance of the Gen set especially of the engine shall be supplied along with the Order. A list of such spare parts along with description and part number and quantity shall be submitted along with the technical bid. Any other spares, consumables required for the commissioning operation shall also be supplied. Engine lubricating oil as recommended by the engine manufacturer, shall be provided for use during the installation and commissioning run.

14.0 **SUBMITTALS**

14.1 Documents for submission along with the technical bid -

The following document shall be submitted along with the technical bid:

i) GA drawing of Generator Set and Control Panel.

ii) Engine data Sheet

iii) Sizing of the engine generator set. Furnish calculation of Engine BHP for matching with alternator capacity. Calculation should be approved by the Gen Set manufacturer.

iv) Acoustic Enclosure Dimensions indicating height etc.

v) Exhaust piping arrangement including height of exhaust.

vi) Transient response of frequency and voltage for the generator set.

vii) Auxiliary Equipment - Specification or data sheets, including switchgear, spring type vibration isolators.

viii) Drawings - General dimensions drawings showing overall generator set measurements, mounting location, and interconnect points for load leads, fuel, exhaust, cooling and drain lines

ix) Wiring Diagrams - Wiring diagrams, schematics and control panel outline drawings published by the manufacturer for use by owner.

x) Warranty Statements - Warranty verification published by the manufacturer.

xi) Service - Location and description of supplier's parts and service facility including parts inventory and number of qualified generator set service personnel.

14.2 Drawings for approval on award of the order: The drawings shall be submitted within one month of placement of the purchase order: - (4 copy each):

The supplier shall prepare and submit 4 sets of drawings and get them approved from OIL before start of the work. The approval of drawings however does not absolve the contractor not to supply the equipments/materials as per agreement, if there is any contradiction between the approved drawings and agreement.

The supplier shall submit the drawings to Head-Materials for approval before start of work. The supplier shall commence work as soon as the drawings submitted by him are approved.

a) Layout drawings of the equipments to be installed including control cables, fuel/luboil pipes and supports/structure for exhaust piping, chimney and bus ducts/cable trays.

b) Drawings including section, showing the details of erection of equipments.

c) Electrical wiring diagrams from engine-alternator set to electrical control panel to essential LT board including the sizes and capacities of the various electrical/control cables and equipment.

d) Dimensioned drawings of Acoustic enclosure/Engine-alternator set and electrical control panel.

e) Dawings showing details of supports for pipes, chimney cable trays, ducts etc.

f) Any other drawings relevant to the work.

14.3 Documents for submission before the pre-dispatch inspection:

Two copies of the Integrated Operation & Maintenance Manual for the complete Generator Set including operating instructions with description and illustration of all switch gear controls & indicators, all generator controls and all engine controls

14.4 Drawing / Documents to be furnished on completion of installation:

Three sets of the following laminated drawings shall be submitted by the supplier while handing over the generator set to OIL. One set shall be laminated on a hard base for display in the generator set room/room where the panel is installed and another set shall be displayed in JE's room. In addition, drawings will be given on Compact Disc (CD):

a) Generator set installation drawings giving complete details of all the equipments, including their foundations.

b) Line diagram and layout of all electrical control panels giving switchgear ratings and their disposition, cable feeder sizes and their layout.

c) Control wiring drawings with all control components and sequence of operations to explain the operation of control circuits.

d) Manufacturer's technical catalogues of all equipment and accessories

e) Operation and maintenance Manual of all major equipments, detailing all adjustments, operation and maintenance procedure.

f) Integrated Operation & Maintenance Manual for the complete Generator Set including operating instructions with description and illustration of all switch gear controls & indicators, all generator controls and all engine controls. Quantity to be supplied: One per Gen set

g) Engine Shop Manual (Engine Rebuilding Manual). Quantity to be supplied: Two with this order.

h) Parts Books - that illustrates and list all assemblies, subassemblies and components, except standard fastening hardware (nuts, bolts, washers, etc.). Quantity to be supplied: One per Gen set

i) Routine Test Procedures - for all electronic and electrical circuits and for the main AC generator. Quantity to be supplied: One per Gen set

j) Troubleshooting Chart - covering the complete generator set showing description of trouble, probable cause and suggested remedy. Quantity to be supplied: One per Gen set

k) Wiring Diagrams and Schematics - showing function of all electrical components. Quantity to be supplied: One per Gen set

l) Alternator Operation, Maintenance & Spare Part Manual. Quantity to be supplied: One per Gen set

m) Generator Set Test Certificate.

n) Alternator Test Certificate.

o) Certificate that the item has been designed, manufactured and tested conforming to the requirements & specifications

p) OEMs test certificates if individuals sub-assemblies

q) Warranty Certificate

15.0 **INSPECTION AND TESTING**

(For inspection and testing of electrical items refer **Section A**)

OIL as purchaser shall have right to carry out stage inspection and shop visit to review the manufacturing progress but such inspection shall not relieve the bidder of his responsibility to ensure that the equipment supplied is free from all manufacturing and other defects and conform to correct specifications. The bidder/manufacturer shall be notified in advance, if it is intended to inspect plant or material. However, manufacturer need not hold any manufacturing activity for witness of purchaser's stage inspection.

15.1 **PREDELIVERY INSPECTION**

i) Pre-delivery inspection shall be performed by OIL to insure all generating set components, controls, and switchgear are included as specified herein, free from any defects and carry full load prior to delivery and acceptance. The testing of the Gen Sets shall necessarily be carried out at factory/ manufacturer premises in presence of representatives of OIL. The manufacturer or its representative shall give a notice in advance of minimum four weeks for carrying out pre-delivery inspection and shall arrange staff/fuel/POL and any other consumables for test run at his cost. OIL shall witness such inspection & testing at mutually agreed date and will bear the cost of its inspection visit to the factory.

ii) All major items/ equipments i.e. engine, alternator and associated electrical control panels etc. shall be offered for inspection and testing assembled as unit.

iii) Gen Sets will be tested on load banks for the rated KW rating. Testing shall be for a minimum of 1 hour at 80% load, 1 hr. at 100% load, 1 hr. at 110% load.

iv) During testing all controls/ operations safeties will be checked and proper record will be maintained by the manufacturer's representative. Any defect/ abnormality noticed during testing shall be rectified. The testing will be declared successful only when no abnormality/ failure are noticed during the testing.

v) Any defects which become evident during the test shall be corrected by the bidder at his own expense prior to shipment to the jobsite.

vi) The Gen set will be cleared for dispatch to site only when the testing is declared successful by OIL.

vii) A copy of the test results shall be submitted to the OIL at the end of the inspection. Test results shall show manufacturer's tolerances as well as actual parameters recorded.

15.2 **DISPATCH/SHIPMENT TO SITE**: The items shall be dispatched only after OIL's satisfactory inspection and advice.

16.0 **INSTALLATION AND COMMISSIONING AT SITE AND HANDING OVER TO OIL**

(For installation and commissioning of electrical items refer to **Section A)**

i) Installation and Commissioning of the generating set complete with control panel, Radiator/cooling Tower shall be carried out by the bidder in the presence of OIL representatives at sites at Duliajan, Assam (India).

ii) Installation / commissioning charges should be quoted separately which shall be considered for evaluation of the offers. These charges should include amongst others to and from fares, boarding/ lodging and other expenses of the service personnel during their stay at Duliajan, Assam (India). All Personal, Income and Service Tax etc. towards the services provided by the bidder shall be borne by the bidder and will be deducted at source by OIL

iii) Bidders should also confirm about installation/ commissioning in the Technical Bid.

iv) Materials required for completing fuel, water, air line and exhaust supports shall be provided by OIL during the installation and commissioning at sites.

v) OIL, may on request provide, arc welding and oxyacetylene cutting set with necessary hot/cold work permits for the above jobs.

vi) The representative shall provide list of tools and equipment available with the manufacturer to carry-out the installation and commissioning work. All the safety gadgets required for safe work shall be provided by the bidder. Any appliances, apparatus and labor etc. necessary for the tests shall have to be provided by the bidder at his cost.

vii) The bidder shall be responsible for safety of its personnel and equipment during the commissioning work.

viii) During the installation & commissioning job, the bidder shall strictly ensure that all the cut ends of cables, packing materials, leftover items are removed from site after completion of work.

No environmental damage shall be done while carrying out the job.

ix) The installation shall be performed in strict accordance with shop drawings, specifications, and the manufacturer's instructions and as per tender specifications.

x) All equipment manufacturers/representative shall furnish the services of factory-trained personnel as required during installation and through the warranty period to inspect the installation, supervise startup of equipment installed, and repair the equipment when required. Service requests shall be answered and acted upon promptly.

xi) The responsibility for performance to the specifications shall not be divided among individual component manufacturers, but must be assumed solely by the primary manufacturer. This includes generating system design, manufacture, test, and having a local supplier responsible for service, parts and warranty for the total system

17.0 **TRIAL RUN/RUN-IN PERIOD**:

After installation and successful testing of the generator set site, a trial run at available load will be carried out for 72 hours. The generator set will be operated and a log of all relevant parameters will be maintained during this period. The supplier is free to carry out necessary adjustments. The generator set will be said to have successfully completed the trail run, if no breakdown or abnormal /unsatisfactory operation of any component of the entire generator set complete included in the scope of supply, occurs during this period. After this the generator set will be made available for beneficial use. After the gen set has operated without any major breakdown/trouble, it shall be taken over by OIL subject to guarantee/warrantee clause of the tender. This date of taking over of the generator set, after trouble free operation during the trial run/running -in period, shall be the date of acceptance /taking over.

18.0 **SERVICE AND WARRANTY**

i) The supplier shall ensure adequate and prompt after sales service free of cost during guarantee period, and against payment after the guarantee period is over, in the form of maintenance, spares and personnel as and when required during normal life span of the equipments and shall minimize the breakdown period. In case of equipment supplied by other manufacturers the supplier shall furnish a guarantee/warrantee from the manufacturer for the same before the generator set is taken over.

ii) The nature of after sales service, which can be provided by the bidder, during initial erection and commissioning as also subsequent operation should be clearly stated in the quotation.

iii) The manufacturer shall have a local authorized dealer who can provide factory trained servicemen, the required stock of replacement parts, technical assistance, and warranty administration.

iv) The manufacturer's authorized dealer shall have a parts and service facility within 100 km of the Job Site.

v) The manufacturer's authorized dealer shall have sufficient parts inventory to maintain over the counter availability of at least 90% of any normal wear and tear parts. (Belts, hoses, filters, turbines, pumps, safeties, regulators, injectors, gaskets)

vi) The manufacturer's authorized dealer shall have factory trained service representatives and tooling necessary to install and commission all provided equipment.

vii) The warranty period for the Gen set and ancillary equipment should be a minimum of 18 months from the date of dispatch/ shipment or 12 months from the date of commissioning of the equipment whichever is earlier.

viii) The warranty coverage shall include repair parts, labor, reasonable travel expense necessary for repairs at the jobsite, and expendables (lubricating oil, filters, antifreeze, and other service items made unusable by the defect) used during the course of repair or any defects in the engine or alternator during warranty period shall be replaced by the party at his cost without any extra charge to OIL

ix) Running hours shall not be a limiting factor for the warranty coverage by either the manufacturer or the authorized dealer.

x) Offer received without written warranties as specified will be rejected in their entirety.

19.0 **ORIENTATION**

The system manufacturer's authorized dealer shall provide a complete orientation for OIL's engineering and maintenance personnel. Orientation shall include both classroom and hands-on instruction. Topics covered shall include control operation, schematics, wiring and diagrams, meters, indicators, warning lights, shutdown system and routine maintenance.

20.0 **GENERAL NOTES TO TECHNICAL SPECIFICATION**

a) All sundry equipments, fittings, assemblies, accessories, hardware items, foundation bolts, supports, termination lugs for electrical connections, cable glands, junction boxes and all other sundry items for proper assembly and installation of the various equipments and components of the generator sets are deemed to have included in the tender, irrespective of the fact that whether such items are specifically mentioned in the tender documents or not.

b) The offer will not be acceptable if the bidder do not quote for all items of the tender, supply, installation, commissioning of all items

c) In their offer the bidder must mention their detailed comments point-wise against each point of tender specifications. Any deviation from the tender specification shall be specifically mentioned. Specific type and make of equipment should be mentioned. All the information required as per tender specifications must be submitted.

d) The bidders shall provide overall dimensions of the Gen set, Acoustic Enclosure and foundation/installation diagram of the Gen set.

e) In the event of order, the supplier shall submit to OIL within one month of placement of order all documents and drawings as required against each item.

f) The manufacture of the equipment is to be started only after written approval of the drawings / documents by OIL as mentioned in tender against all equipment.

g) Bidder must confirm in the Technical Bid that the major equipment such as Gas Engine and Alternator shall have manufacturer's Test Report and Warranty Certificate and the same shall be provided during inspection of the Generator set by OIL.

21.0 General Notes for Bidders :-

(Bidders should confirm each & every point clearly. Deviations, if any, should be highlighted in the quotation.)

1.0 Materials shall be brand new, unused & of prime quality.

2.0 Pre-dispatch/Shipment Inspection & Testing charges, if any, must be quoted Separately on lump sum basis which shall be considered for evaluation of the offers. To and fro fares, boarding/ lodging and other en-route expenses of OIL's Inspection team for carrying our inspection shall be borne by OIL.

3.0 Installation & Commissioning :

3.1 The successful bidder will be required to install and commission the unit by their competent service engineer.

3.2 Installation/ Commissioning charges must be quoted separately on lumpsum basis which shall be considered for evaluation of the offers. Total Nos. of days required for commissioning shall also be clearly indicated by the bidders.

3.3 While quoting Installation/Commissioning above, bidder should take into account all charges including to and fro fares, boarding/lodging, local transport at Duliajan, Assam and other expenses of supplier's personnel during their stay at Duliajan. OIL may provide accommodation on Chargeable basis subject to availability. Bidder should confirm about providing all these services in their Bid. However, OIL reserves the right to avail such services at its own discretion.

4.0 **Tax & Duties:**

(i) All taxes, stamp duties and other levies imposed outside India shall be the responsibility of the Bidder/Seller and charges thereof shall be included in the offered rates.

(ii) All Taxes & levies imposed in India, for the services including installation & commissioning, shall be to the Bidder/Seller's account.

(iii) Income Tax on the value of the Services rendered by the Bidder /Seller in connection with installation, commissioning, training etc. shall be deducted

at source from the invoices at the appropriate rate under the I.T. Act & Rules from time to time.

5.0 **Payment** : Payment shall be released as follows:

i) 80 % of the order value shall be paid against dispatch / shipment of the goods.

ii) Balance 20 % of the order value along with the commissioning charges shall be paid after successful commissioning and acceptance of the item by OIL.

OIL may also consider 100 % payment against shipment / despatch document provided bidder agree to pay the interest for 20 % of order value and also submit Bank Guarantee equivalent to 20 % of the order value in addition to the Performance Security of 10 %.

Any offer not complying with the above shall be loaded at one percent above the prevailing Bank rate (CC rate) of State Bank of India for evaluation purpose.

6.0 Oil India Purchase Order No. must be engraved on the body of the item. Bidder must confirm the same categorically in their quotation.

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SPECIFICATION OF ELECTRICAL ITEMS

A. SPECIFICATION OF ALTERNATOR

1.Make:KIRLOSKAR/NGEF/STAMFORD/CROMPTONGREAVES/CATERPILLAR/ KATO/GENERAL ELECTRIC USA

2. Rated Output : 500 KVA at0.8 PF at Specified ambient conditions for utility and motor loads

3. Rated Voltage : 415 Volts ± 5%

4. Armature Winding : 3 Phase, 4 wire type

5. Rated Frequency : 50 Hz ± 3%

6. Rated power factor : 0.8 lagging

7. Class of insulation : Class F/H but temp rise limited to class B

8. RPM : As per engine rated speed

9. Phase sequence: UVW - phase sequence and direction of rotation shall be clearly marked on the alternator.

10. Duty/load: Continuous duty rated Alternator.

11. Winding Connection: Y connected. Separate neutral terminal required

12. Ambient : Min: 5 °C Max: 40 °C, RH 95% max

13. Alternators Enclosure Protection : IP 23

14. Alternators Terminal Box Protection: IP 54

15. Excitation system: Brush less, self excited, self Regulated with solid state AVR. Voltage characteristics- VG3 as per Table-1, IS-13364 (Part-2)

16. Mounting: Foot mounted on Gen set skid that has been mounted on anti vibration pad.

17. Permissible voltage variation: As per Table-1, IS-13364 (Part-2)

18. Permissible frequency variation: As per IS-13364(P-2)

19. Frame size: Bidder to confirm

20. Waveform deviation: As per IS-13364 (Part-2)

21. Unbalanced current: As per IS-13364 (Part-2)

22. Short circuit current: As per IS-13364 (Part-2)

23. Cooling : Air cooled by integral fan

24. The brush less alternator shall have exciter and rotating rectifier-bridge mounted on shaft complete with diodes and surge suppressor, main field windings and stator windings. PIV of exciter diodes must be 800v or 8 times the maximum exciter armature operating voltage, whichever is higher. At nominal speed the excitation system must produce sufficient residual voltage in order to ensure self-excitation.

25. All windings should be made from electrolytic grade copper of high purity.

26. The alternator shaft shall be supported on rolling element bearings at NDE or at both DE/NDE.

27. Voltage swing (Transient response): As per IS-13364 (Part-2).

28. The alternator should be capable of sustaining a 10 % over load for one hour in any 12 hours operation.

29. Total voltage harmonic distortion should be less than 3 % between phases at no load.

30. The alternator should be capable of withstanding 1.2 times the rated speed for two minutes without any damage.

31. Alternator stator winding terminals are to be connected to 4 nos. of suitably rated tinned copper terminals, supported on SMC/GRP supports inside the alternator terminal box.

32. The alternator terminal box should be of suitable size and should be suitable for terminating power cables of alternator.

33. 2 nos. of earth points are to be provided on both sides of the alternator.

34. Lifting hooks are to be provided for lifting the alternator.

35. Automatic voltage regulator should be mounted with approved rubber bushes under AVR mounting holes to reduce vibration. AVR shall be suitable for motor loads, VG3 regulation.

36. Alternator windings and AVR should be suitable for humid atmosphere as per ambient conditions mentioned in the enquiry.

37. Bidder to mention the following information in offer

(i) Unbalanced current carrying capacity

(ii) Efficiency of the alternator at 25 %, 50 %, 75 % and 100 % load.

(iii) Power factor of the alternator at 25 %, 50 %, 75 % and 100 % load.

(iv) Dimensional drawings.

38. Alternator frame and enclosure shall be made from MS or Cast steel.

39. The permissible vibration of the alternator shall be as per IS-12075.

40. The alternator shall conform to the following standards: Latest publications of all IS Standards shall be referred.

(i) IS: 12065 Noise limit

(ii) IS: 12075 Vibration

(iii) IS: 4691 Enclosure Protection

(iv) IS: 6362 Cooling

(v) IS: 2253 Mounting

(vi) IS: 13364 Specification of Alternator coupled with IC Engines

B. SPECIFICATION OF GENERATOR CONTROL PANEL

A separate control panel inside the genset house (acoustic enclosure) shall be provided for mounting of generator circuit breaker, switches/relays, metering, control and protection devices. The detailed description of the panel is as follows.

Sheet steel clad, self-supporting, floor mounting, cubicle type, dust and vermin proof generating set control panel made of 2mm thick MS CRCA sheet and built upon rigid framework of channels, beams as required, having front and rear hinged doors with danger plate fitted on both sides, lifting lugs on top, ventilation louvers on both sides, bottom detachable gland plates, double earthing studs on two sides, complete with suitably sized zinc passivated hard wares with heavy plain and spring washers. The panel doors should have neoprene rubber gasket. The panel should be designed and manufactured as per IS-8623. The panel enclosure will be as per IP54 except for the open part of cooling louvers at bottom and top of the panel sides. Suitable wire mesh should be provided on the inner side of the louvers to prevent entry of insects. The metal surface of the panel should be given seven tanks anti corrosion treatment and then powder coated in DA grey colour (Min. 50 micron thick paint). The frame should be able to withstand the stress and vibration during transportation and operation. All cable entry shall be from bottom side. Separate removable gland plates shall be provided for all cables. Provision shall be made in the bottom channel for grouting of the panel.

The detail description of the components of the panel is as described below:

The panel should broadly have the following compartments/sections.

1) Incomer/Bus bar Section

2) Generator Protection Section

3) Generator control section

4) Engine control section

1) **INCOMER/BUS BAR SECTION- MAIN COMPONENTS:**

a) Breaker MCCB:

1 No. 690 V, 1000 Amps, 4 pole, draw out type ACB, 50 KA breaking capacity, with inbuilt microprocessor based, adjustable overload & short circuit, earth fault protection, Under voltage trip coil. ACB shall have motorized and manual spring charging mechanism and OFF push button. ON push button for manual switching on the breaker shall be provided but this button shall be covered to prevent inadvertent operation as during normal operation ACB shall switch ON automatically after the genset starts and rated voltage builds up. Make/Model: Sentron 3WL 1210 of Siemens/ NW 10 H1 of Merlin Gerin/ Spectronic- S of GE.

This is the main circuit breaker. The ACB should trip on the following faults:

i) Over load, short circuit and earth fault- Tripping from internal trip unit of MCCB

ii) Over/under voltage & Over/under Frequency- From voltage and frequency relays

iii) Engine fault (Low lube oil, high water temp, over speed)- Trip contact from engine protection system

Incoming and outgoing power cables shall terminate on electrolytic grade, high conductivity electro-tinned copper links or spreader bars liberally sized for termination of all power cables. Three nos. incoming and three nos. outgoing power cables of 3.5x240 sq.mm, 1100v grade, stranded, aluminium conductor type shall be used for termination at incoming and outgoing terminals of the panel. Neutral bar shall also have provision for connection of lead for neutral earth.

b) Busbars: Panel shall have one set of TP & N electrolytic grade, high conductivity, electro tinned copper bus-bars, made from rectangular sections confirming to IS, rated 1500 Amps (Free air rating of sections) and supported at required intervals to withstand short circuit fault levels up to 50 KA for 1 Sec. Rating of neutral bus shall be minimum 50% of phase bus rating. Bus-bar

support shall be non- hygroscope GRP/FRP and the Bus-bar shall be insulated with heat shrinkable PVC sleeves.

Incoming and outgoing power cables to/from ACB shall terminate on electrolytic grade, high conductivity electro tinned copper spreader bar/links liberally sized for termination of all power cables. Neutral bar shall also have provision for connection of neutral earth cables. All cables to the panel will enter through a detachable gland plate at the bottom of the panel. All cables will be terminated through suitably sized single compression glands and connections will be made through properly rated terminal strips and tinned copper sweating sockets crimped rigidly to the copper conductors.

2) **Generator Protection Section**:

This section shall have protection features for the generator and the engine.

The generator ACB should trip or alarm annunciated on the following faults:

i) Over load, short circuit and earth fault- Tripping from generator protection relay

ii) Low and high Engine Speed- Trip signal from engine protection system

iii) Over and under voltage- Trip signal from generator protection relay

iv) Generator winding, bearing over temperature- Trip signal from generator protection relay

v) Engine fault (Low lube oil, high water temp, over speed)- Trip signal from engine protection system

Components of the protection system:

" Built-in long time overload, short time fault, instantaneous short circuit, earth fault protections- in the ACB

" 1No. Microprocessor based Generator Protection Relay providing protection against thermal overload, over current, short circuit, earth fault, over and under voltage, over and under frequency, negative phase sequence. Relay type: Micom P127 of AREVA/ Sepam Series 40 of Merlin Gerin/ Siprotec Compact 7SJ80 of Siemens

" For above, Bar Primary Resin Cast CT of 1000/5 ratio, min 15 VA burden, class-1, conforming to IS 2705. No of CTs as per circuit requirement. Make: AEI/ kappa / Conzerv/ L&T

" 1 No. digital temp scanner and controller with 6 channels for winding RTDs and two channels for bearing RTDs. Temp scanner to be suitable for RTDs fitted in alternator. In case of any over temperature controller shall give annunciation through LED type indicating lamp mounted on panel front cover and trip the generator ACB. Scanner make: Micro scan/ Honeywell/Merlin Gerin.

3) **Generator Control Section: This section shall have:**

a) Meters:

1 No. Three phase digital Voltmeter with selector switch, Size- 96x96 mm, Class of accuracy 0.5, 0 - 500 V, Auxiliary power supply -230VAC (Make: AE I/ Conzerv/ L&T)

1 No. Three phase digital ammeter with selector switch, Size- 96x 96mm sq. mm, 0-500 Amps, C.T. operated , Auxiliary power supply 230V AC, class of accuracy - 0.5 (Make: AEI/ Conzerv/ L&T)

1 No.Digital DC Voltmeter, Size- 96x96 mm, Class of accuracy 0.5, 0 - 50 V

1 No. Digital frequency meter, scaled 0-100 Hz, suitable for 240 V AC operation, (Make: AEI / Conzerv/ L&T)

1 No. Power & Energy monitor showing Voltage, current, power (KW), Power factor, KWH & Maximum demand, 5 elements of power showing at a glance with communication port compatible to PCs. Make of Meter - Siemens (Sentron PAC 3200)/ SOCOMEC -HPL (Model -DIRIS A 40/A41)/ Schneider Group (Model-PM700)/ Conzerv (Model EM 6600). Bar Primary Resin Cast CT of 200/5 ratio, 15 VA burden, class-1, conforming to IS 2705.

No of CTs as per circuit requirement. Make of CT: AEI/ kappa / L&T

Suitably rated CTs, CT ratio 200/5, class I for ammeter, kW meter and PF meter (Make: Kappa / Conzerv/ L&T.)

1 No. Hour meter to record running hours of the genset.

All meters shall be mounted in front of the panel.

b) Indications:

Indications for the following are to be provided:

(a) Engine running

(b) Power supply on for R, Y &B phases

(c) Trip circuit healthy

(d) Electrical fault (From aux contact of trip unit of ACB)

(e) Over/under voltage

(f) Over/under frequency

(g) Engine fault

(h) Set on load

i) Over temp. for bearing and winding

j) Battery charger ON

All indication lamps shall be of LED type (Make: Binay/ Technic/ L&T) and shall be mounted in front of the panel.

A separate annunciation window (multi-window type) with audible alarm for showing engine and alternator faults, gas alarm etc. shall also be provided.

Push buttons for acknowledging/ resetting alarms, checking healthiness of trip circuits etc. shall also be provided.

c) Fuses: HRC instrument fuse holders, phenol moulded with suitable fuses & links for different circuits. Separate fuses and neutral links should be provided for control circuit indicating system lamps, instruments, enclosure illumination and tripping circuit (Make-Bussman/GE)

All meters, indication lamps shall be protected by adequate nos. of HRC instrument fuses of suitable rating.

d) Auxiliary relays:

i) Auxiliary Relays /Contactors will be provided as per requirement of the control circuits. (Make: Siemens/Telemecanique/ABB/BCH/L&T/Indo-Asian).All relays should have minimum 2 nos. spare contacts. No. of relays should be as per the control circuit requirement. Plug in type relays and contactors shall not be used. Current rating of aux contacts shall be as per control circuit requirement.

e) One no. battery charger shall be provided inside the panel for charging the battery. Means shall be provided to cut off the charger output during starting of the engine.

f) Space heater with back up MCB and adjustable thermostat shall be provided inside panel to maintain the panel interior temp at 25 to 35 Deg C.

4) **Engine control section: This section shall have**:

Digital RPM meter -1 No.

Engine alarm and trip condition monitoring

Engine start/stop controls

Battery charger circuit

Emergency stop switch (mushroom head type)

The following engine conditions should give alarm indication:

a) Low lube oil pressure (low set point)

b) High water temp. (low set point)

c) Engine over speed (low set point)

d) Low Gas Pressure

e) High Exhaust Temperature

f) Low battery voltage

In addition, engine should be stopped with the help of heavy-duty 24V D.C. fuel solenoid on following trip conditions.

a) Low lube oil pressure

b) High water temp.

c) Engine over speed

d) High Vibration

Indication of each of the trips shall be provided in the front multi-annunciator window of the Engine control section. Suitable relay/ timer arrangement shall be provided wherever required.

Push buttons shall be provided for:

(a) Accept fault

(b) Reset alarm

(c) Engine start/ stop

(d) Lamp test

Hooter/alarm to indicate Engine trip on fault

All indication/metering/controls shall be mounted in front of the panel.

B.1. CHANGE OVER SWITCH:

Output from the control panel bus bars shall be terminated on one incomer of an on-load changeover switch. Outgoing cable of the genset shall be connected to the outgoing side of the changeover switch. The other incomer of the changeover shall be reserved for connection to the mains supply. Description of the changeover switch is as follows.

One no. four pole on load changeover type switch rated for 1000 Amp. The switch shall be mounted on the genset skid with suitable enclosure(or inside the control panel). Connection links/spreader bars shall be provided with switch for proper termination of all power cables. Power wiring from control panel to COS shall be done by the manufacturer. Sufficient space and arrangement shall also be provided in COS enclosure for entry and termination of main power cables to user load centre. The power cable size is 2 or 3 runs of 3.5x 240 sq mm, PVC insulated, PVC sheathed, Armoured cable with aluminium conductor. Make of switch: HPL- Socomec/GE/Siemens.

B.2. MOTOR STARTER PANEL

SPECIFICATION FOR MCC PANEL FOR AUX. MOTORS OF GENSET PACKAGE AND AUXILIARIES (If provided):

Manufacturer shall also provide starter panels (MCC panels) along with necessary cables for any motors provided with the genset necessary for operation, such as lube oil circulation, radiator cooling fans, enclosure ventilation fans etc. The starter panels shall either be inside the acoustic enclosure or separately mounted and complete with breakers (isolation), contactors, thermal overload relays, indication lamps, voltmeters etc.

GENERAL FEATURES:

The MCC shall have the following features:

Sheet steel clad cubicle made of 2.0mm thick MS CR sheet, cubicle type. Bottom support structure to be made from 3.15 mm thick CR sheet. Higher sized

sheet to be used for structure if required for proper strength and stability of the panel

Self-supporting, floor mounting, built on rigid framework

The entire metal work shall be treated with seven tank antirust treatment as per IS and then powder coated in DA Grey colour

Indoor, industrial, cubicle type with provision of extension of panels in future

Dust and vermin proof as per IP54

Internal power wiring with tinned copper bars and stranded copper wires of suitable conductor area

All wiring to have lugs and ferrules as per drawing

Internal earthing of all CFS units, other equipment having earthing terminal and panel doors with suitably rated, PVC insulated, flexible copper earth wires/ copper braids of suitable rating as per IS

Brought out Terminals for each cubicle for connection to cable. Neutral terminal shall be heavy duty type.

Terminal blocks for each cubicle for control wiring termination

Suitable for operation from front side

Provision of inspection from backside

Internal barriers between cubicles to provide Form-2 separation as per IEC to prevent transmission of flashover in one panel to other panels

Danger plates fitted on front and back

Conforming to IS-8623

Lifting lugs provided on top

Ventilation louvers guarded with wire mesh

Bottom detachable gland plates for all cable entries

Earthing bus at bottom of the panel. Earthing Bus to be made of GI straps, 80 micron galvanisation thickness. Strap size shall comply with IS-3043 for carrying the rated fault current. The rated fault current will be same as the fault current withstand level specified for main busbar. However, minimum size of earth bus shall be 50x6mm. Earth bus shall have holes drilled for connection with main earth electrodes and earth cable/ strap of outgoing feeders

PANEL COMPARTMENTS / SECTIONS

The panel shall broadly have the following compartments / sections.

i) Incomer section

ii) Bus chamber and cable chamber

iii) Outgoing section

Motor starters Feeders

i) Incomer Section:

The incomer section shall have one no. incomer panel and shall have following features and components:

1. One no. MCCB, 415V, 125 amp (This is Minimum rating of switch, but higher size switch shall be used if required considering Motor rating, actual rating of switch shall be selected in consultation with OIL),

2. LED type indicating lamps. Lamps required are: Incoming Phases R,Y,B, Incomer ON/OFF.

3. BIS approved CTs for metering circuits. Cast resin type CTs, 15va burden and class as per BIS. CTR: As per incomer switch rating. Class-1

4. Control wiring with separate protective fuses for necessary connection of all devices. Wiring to be done with single core, PVC insulated, 1100v grade, BIS approved stranded copper cable of 2.5 sq mm size.

5. 1 No. Panel mounted Three Phase Digital Ammeter, 96x96mm size with phase selector button and 3 Nos. IS approved wire-wound, metering class CTs. Meter range and CTR as per incomer rating.

ii) Bus Chamber:

The bus chamber shall consist of 1 set TP & N electrolytic grade, high conductivity electro tinned copper bus-bars made from 99.99% IACS copper of rectangular cross section, conforming to BIS. Current rating of bus-bar sections should be 1.5 times the incomer switch rating, rating of neutral bus shall be 50% of phase bus rating. Bus-bar should be supported at required intervals to withstand short circuit fault levels up to 25 KA for 1 sec.

iii) Outgoing Section

1. The MCC will have starters for all the motors of the genset auxiliaries and cooling system water pumps. Three nos. of spare starter panels fitted with all the components as in the main starter panels shall be provided in the MCC. Minimum two nos. of spare starter panels shall be for highest rated motor, however, OIL shall decide the final rating for spare starter panels. All Starter panels shall be as specified below:

Specification for all Starters:

The starter shall be Direct-on-Line type for motors up to 15 HP and Star-Delta type for motors above 15 HP. Each starter shall be housed in its own cubicle.

Each starter cubicle and any other starter that is mounted outside the MCC cubicle shall have:

a) Suitably rated MCCB as the incomer, with adjustable thermal magnetic settings.

b) Power contactor(s) with, auxiliary contacts. AC3 current rating of Power contactor for starter should be 40% higher than the AC 3 current rating of the contactors recommended by motor starter selection chart of L&T/ Siemens.

c) Suitably rated bimetallic thermal overload relay with AUTO/ MANUAL reset.

d) Electronic timer for Y/D delay (in case of Y/D starter)

e) Earth leakage relay wired with separate CBCT and with adjustable earth leakage current range 0-300mA & time range 0- 1.0 Sec in multiple steps, duly wired up to trip the starter in case of Earth Leakage fault in power circuit. Earth leakage relay required for motors above 5kw rating only.

f) Set of Start /Stop push buttons. Weatherproof type external push button stations shall also be provided for all motors and located near the motor on a suitable support. This is required for remote operation of motor. PBS shall be IP-65 enclosure with metallic construction. Also, provision of terminals for Start / Stop from remote PBS.

g) Local/ Remote selector switch

h) Digital Ammeter, suitably rated (CT operated)

i) CTs of suitable rating for ammeter.

j) Set of suitably rated brought terminals, copper crimp type lugs for all motor cable connections including terminals for remote push button station. Set of suitably sized cable glands for all cables including control cable and cable for remote PB station.

j) Moulded fuse holders, suitably fused, for control & metering circuits. Fuse holder with solid link shall be provided for neutral in each panel. All fuses shall be HRC with bolted connections.

k) Control circuit shall operate on 240vAC.

l) LED type indicating lamps with complete fittings, suitable for 240VAC, 50 Hz, system with legend plate for

motor ON/OFF/TRIP indications

m) Suitable interlock shall be provided in starters wherever required for interlocking with respective genset for safety and reliability.

2. Four nos. of separate outgoing feeders shall be provided for other utilities. Each feeder to have MCCB unit of 100 amp with thermal/magnetic OL/SC adjustable settings. Heavy duty neutral link with bolts shall be provided in each panel.

3. Any other feeder not mentioned but is required for powering auxiliaries required for proper genset operation.

CABLE ARRANGEMENT IN MCC:

All cables to the panel will enter through a detachable gland plate at the bottom of the panel. All cables will enter the enclosure through suitably sized heavy duty, single compression glands and connections will be made through properly rated tinned copper terminal strips. Cable alleys will be provided as necessary for running the cables in the panel. Detachable gland plates for adequate size and number of cables shall be provided at the bottom of the panel for incoming and outgoing cables. Space inside MCC shall be sufficient for armoured, aluminium cables.

Make of MCC shall be same as the make of Generator Control Panel or any of the following makes: Lotus Switchgear Bangalore, PCE Projects Kolkata, Key Electricals Kolkata, Assam Electricals Tinsukia, ElectrokingsJorhat, Pyrotec Udaipur, RIghill Electrics Pvt. Ltd. Bhopal.

Make of Components for MCC:

MCCB: Legrand/ Siemens/Schneider Electric/ABB/GE

Fuse holders/HRC fuses: Bussman/GE

Contactors: Siemens/GE/Telemecanique/ABB/Indo-Asian

Thermal Overload relays Same as make of contactor

Numeric/ Electronic relays: Areva/ Schneider/Siemens

Electronic time delay relay: Siemens / GE/ Schneider

Start /Stop push button Station: BCH / Siemens / L&T/Baliga

Earth leakage relay & CBCT: Merlin Gerin/Legrand

Meters: Conserv/ HPL

CTs: Kappa / AE

Meter sector switches: Kaycee / Rishabh / Salzer

LED Indication lamps: Binay, Siemens, L&T Industrial type

Control wires: Finolex/ Havells/ or reputed brands

Control Transformer: AE/L&T/Kappa

B.3. WIRING SCHEME

i) Control voltage for generator control: 240VAC. Control system wiring shall be done with 1.5 sq mm, flexible copper, 1100V grade PVC insulated wires approved by ISI, TAC, FIA. All wiring will have copper lugs & terminal blocks as required. Wiring for lighting circuit MCB, power outlet and wiring for CT will be done with 2.5 sq mm, flexible copper, 1100v grade PVC insulated wires approved by ISI, TAC, FIA& have copper lugs. Colour code for wires shall be followed as per IS. Make: Finolex/Havells/ L&T/reputed make.

ii) All power and control wiring inside the enclosure shall be done at manufacturer's works with armoured cables or with single core cables laid in metallic conduits/ casings. Heavy duty Single Compression Cable Glands shall be provided at all cable entries for armoured cables. Cables with conduit wiring shall have suitable entry clamp. All cables shall be with stranded copper conductor and shall be of 1100v grade and approved by ISI.

iii) All control cable terminal ends will have suitable heavy duty crimping lugs of tinned copper. Ferrules shall be provided for identification of cables. All components shall be labeled for identification.

iv) Separate gland plates shall be provided for power and control cables.

v) Separate TB shall be provided for all interconnection cables between control panel and engine.

vi) Provision of exhaust blower power supply shall be required if the blower is fitted inside the acoustic enclosure.

vii) Power supply arrangement with switching and protection shall be also provided for any auxiliary motor, if installed for genset operation.

viii) All auxiliary and main contactors shall be mounted on DIN channel. Plug in relays shall not be used.

ix) Engine control wiring will run from engine to control panel in heavy duty ISI approved galvanized flexible conduit supplied by the party.

Control panel shall preferably be manufactured by the Genset Manufacturer.

C. DOCUMENTS

1. The following Documents / drawings shall be submitted with the offer

i) GA and schematic drawings of alternator and control panel

ii) Technical literature of alternator

iii) Confirmation that the party agrees to all the points mentioned under electrical specification of generating set. Any deviation from the electrical specifications of the tender will be specifically mentioned by the party with proper justification. Acceptance of deviations shall be at discretion of OIL. Type and make of components shall be as per tender. Equivalent make shall not be acceptable. The bidder shall also specifically confirm even if there is no deviation in their offer from technical specifications.

2. The successful bidder shall obtain approval for the following drawings / documents prior to manufacturing of alternator & control panel within 30 days of placement of order.

i) GA drawing

ii) Documentary evidence from the manufacturer of generator confirming that the alternator to be supplied will meet all specifications as mentioned in the order. Technical catalogue of the generator.

iii) Detailed power & control wiring diagram, detail enclosure drawings for control panel, COS, earthing scheme.

iv) Layout plan of the unit showing all parts, cable routes.

v) Illumination scheme.

vi) Details of power cables, control cable and their routes.

vii) Bill of materials of all components.

viii) CPRI test certificate for bus bar fault level and temperature rise

3. Three sets of following as built documents per gen set shall be submitted in bound form

i) GA drawing

ii) Detailed power & control wiring diagram, detailed enclosure drawings for control panel, earthing

iii) Scheme, layout plan of the unit showing all parts.

iv) Details of power cables, control cable and their routes.

v) Bill of materials of all components.

vi) Technical literature of alternator.

vii) O&M manual for Alternator and main components of control panel.

viii) Catalogues of various components.

ix) All test certificates for tests done at manufacturer's works for alternator, control panel and complete unit.

x) Tests done during commissioning.

xi) Guarantee certificate for alternator and control panel. Guarantee shall be for 12 months after commissioning of Gen set or 18 months after supply, whichever is earlier.

xii) List of recommended spares with cat nos. and description for two years.

D. GENERAL NOTES FOR ELECTRICAL ITEMS AND WORKS:

1. In case of an order the complete electrical specification of the tender shall be mentioned in the order. However, deviations from tender specifications, if mentioned by bidder in their offer and if accepted by OIL in writing, shall also be mentioned in the order.

2. In the event of an order the bidder will submit all documents as per Para C.2 under DOCUMENTS for OIL's approval.

3. The manufacture of the unit shall start only after written approval of the drawings/ documents (as per Para C.2 for Documents) by OIL.

4. In case party cannot submit documents complying with all points mentioned in the order then the order will be cancelled without any obligation on part of OIL.

E. ELECTRICAL SPARES

Following spares shall be supplied by the party along with the complete package for both the Gen sets and their cost shall be included in the total package cost. However, Cost of these spares shall be indicated separately in the cost breakup.

1. AVR Unit for Alternator- One no. per Gen Set

2. Rotating rectifier assembly fitted with complete set of forward and reverse diodes- One set per Gen set

3. Air Circuit Breaker complete with trip unit, coils etc as fitted in ACB mounted inside generator control panel: - One no. per Gen set. This ACB shall be tested by installation inside the control panel during commissioning of the set.

4. Bearings: One set per Gen set

F. INSPECTION AND TESTING FOR ALTERNATOR AND CONTROL PANEL INCLUDING MCC PANEL, IF PROVIDED

All the routine tests as per IS and load tests of the alternator and the control panel shall be witnessed by OIL's Engineer at respective manufacturer's works. The routine test of the alternator will include the following minimum tests/measurements:

1. Measurement of winding resistances for generator armature, field, exciter armature and exciter field

2. Measurement of insulation resistance (before and after HV tests) for generator armature and field, exciter armature and field

3. High voltage (HV) test

4. Phase sequence test

5. Voltage regulation test

6. Vibration measurement

7. Measurement of noise level

8. Overload test

9. Measurement of open circuit and short circuit characteristics

All the routine tests and load tests of the control panel, MCC shall be witnessed by OIL engineers at manufacturer's works. The routine test of the panels will include the following minimum tests/measurements: -

1. Physical checks & Operation check of all components

2. HV tests

3. Insulation tests (before and after HV tests)

Intimation for inspection for each item must be sent to OIL at least 30 days in advance.

Any modification suggested during inspection, to comply with order specs, shall be carried out by supplier at no additional cost. Supplier shall affect dispatch of the unit to OIL, Duliajan only on receipt of OIL's dispatch advice.

G. COMMISSIONING OF ELECTRICAL PART OF THE UNIT

1. Installation and Commissioning of the generating sets, control panels, MCC, Aux. motors shall be carried out by the supplier in the presence of OIL representatives at its fields at Duliajan, Assam (India) as per IS & CEA Regulations 2010 and as per manufacturer's commissioning manual. All installation work shall be carried out by licensed electricians under the supervision of a licensed supervisor. Services of qualified and competent personnel from equipment manufacturer are essential during commissioning of the generating sets. All tools, instruments, hand tools required for the installation and commissioning work shall be brought by party. The instruments shall be calibrated and the calibration should be valid at the time of commissioning. Operational tests of all devises, their settings, shall also be carried out during commissioning job by the supplier. Commissioning manual and formats for recording all tests on various equipment and units shall be sent to OIL along with the unit.

2. All outside (outside of the enclosure) cabling and earthing jobs, supply of earthing cables (external earthing, as described in the "H: Earthing" clause), outgoing power, control and earthing cable terminations with lugs, glands, fasteners, hardware (with supply of these materials), making of earth pits and brick enclosure at field site for gen set and control panel shall be done by party,

as advised and approved by OIL. However, power cables from the unit to outside load centres and earthing materials (electrodes, GI straps etc.) etc. required for installation and commissioning work shall be provided by OIL. OIL shall also make cable trench and road crossings for cables as required. Party shall submit necessary electrical interconnection wiring drawing for cable connection between gen set, MCC, Auxiliaries and control panel along with dispatch documents. Party shall supply and fix marking labels, tags on all equipment, cables as per drawing for proper identification. Any other item required for the job but not specified shall be supplied by party without any cost to OIL.

3. All protective devices, circuit breakers, protective relays (secondary injection test of generator protection relay), equipment shall be tested for proper operation and setting done during commissioning by the commissioning engineer. The commissioning engineer should possess valid electrical supervisor license issued by licensing board, Assam.

4. The Gen set will be treated as successfully commissioned from electrical side after successful load test (reliability run) of the unit at OIL's field site as per details given in Para 14 and 16 of the detailed description.

H. EARTHING:

i) The earthing scheme for the unit should be as per IS-3043.

ii) Two nos. 50x6mm GI straps shall be suitably fixed inside the unit near the floor. These will serve as earth bus. Strap galvanisation thickness should be min. 85 micron and as per IS. Alternator earth terminals, control panel earth terminals, enclosure chassis shall each be connected with two nos. separate single core copper cables to both the straps with independent connections at separate points. The neutral of the alternator will be connected to a neutral grounding resistor unit, placed outside the enclosure (high resistance grounding-not included in the scope of this unit). The other end of the NGR shall be connected to external earth pit through a separate cable. Suitable provision is required in the panel base plate for safe entry of neutral earth cable. Neutral earth cable from alternator neutral point to external NGR (neutral grounding resistance unit) of approximately 10.0 m length shall be supplied by the party.

Heavy duty PVC insulated, PVC sheathed, flexible, single core, ISI approved copper cables of various sizes (as per IS: 3043) shall be used for all earthing jobs. The earthing cables are to be terminated with lugs and suitably protected against mechanical damage. Earth cable shall be protected to avoid any damage and to be run in ISI approved heavy duty galvanized, flexible conduit. Make: Finolex/ Havells/ L&T/reputed brand for earthing cable.

iii) Both the GI straps shall extend up to the back side of the enclosure. Each strap will have one no. of zinc coated terminal stud of 10mm dia provided at end of the straps for connection to external earth. Two nos. of earthing cables of size

& type as mentioned in point no. (ii) above and of individual length of 10.0 mtr shall be supplied and connected to these two straps for external earthing. The neutral earthing lead from the NGR unit as mentioned in point no. (ii) above shall also be brought outside the enclosure for earthing of neutral separately. The free ends of these three cables shall be crimped with heavy duty, tinned copper tubular lugs and marked with ferrules for connection to external earth pits. Suitable opening with rubber bush shall be provided in the rear side of the unit to facilitate the entry of outgoing power cable and earth leads.

(iv) Separate MCC panel for auxiliary motors, if provided, shall also be earthed in a similar manner to external earth electrodes used for the skid earthing.

NGR earth electrode shall not be used for earth connection to other equipment earthing.

I. GUARANTEE

Generator and control panel shall be guaranteed for 12 months after commissioning of Gen set or 18 months after supply, whichever is earlier.

SPECIFICATION FOR AUXILIARY MOTORS

All auxiliary motors for the gen set shall have the following specifications:

Type: Motor shall be 3 phase, squirrel cage, AC Induction type.

Rated output: The motor rating shall be minimum 15% higher than the respective absorbed power required for full rated capacity load handling.

Enclosure: TEFC with Degree of protection - IP55. CI/ MS enclosure painted with DA Grey Paint.

Insulation: Vacuum pressure impregnated. Class F with temperature rise limited to that of class B Standards IS-325.

Voltage: Motor shall be suitable for 415 ± 6% volts, 3 Phase, 50HZ, AC supply and should withstand high voltage fluctuation.

Freq.:50 Hz +- 3%

RPM:To match driven equipment

Duty: Continuous (S1)

Mounting: As per equipment design

Shaft support: Rolling element Bearings at DE and NDE

Cooling: Bidirectional cooling fan at NDE

Starting: DOL for motors up to 12.5 HP; Y/D for motor above 12.5 HP

Ambient: Max. 40°C, Min 6°C, 95% RH, Altitude-150 Meter

Terminal Box: Metallic Cable termination box with brought out terminals suitable for terminating PVCA copper cables of proper size as per rating of motor (No. of cable entries as per type of starter). Terminals shall be of brass and mounted on FRP, DMC insulating plate.

Glands: Adequate nos. of weatherproof double compression, Nickel plated brass glands as per cable size shall be fitted in terminal box of the motor.

Make of Gland: Baliga/GMI/Comet

Earthing: Two nos. of earthing studs to be provided on both sides of the motor.Earthing system for the motor shall be as per the IS: 3043.

Lifting Eye: Lifting hook(s) shall be provided for lifting the motor

Markings: Name plate details with name of manufacturer, frame size, rated voltage, rated out put, current, frequency, type of duty, class of insulation, no. of phases, speed in rpm at rated out put, degree of protection, winding connections, amb. temp, bearing sizes, lubricant, lubrication material and year of manufacture

Certificates: Test certificate of Motor for routine tests done at manufacturer's works shall be submitted with the supply.

Guarantee: Motor shall be guaranteed for one year. Guarantee certificate shall be submitted with the supply.

Make: Bharat Bijlee/ Crompton Greaves/ KEC/ Siemens/NGEF

All motors installed outdoor shall be provided with a suitable metallic/ FRP canopy for protection against rain.

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SPECIFICATION OF ACOUSTIC ENCLOSURE

1. Acoustic Enclosure:

a) The Acoustic enclosure shall be designed and manufactured conforming to relevant standards suitable for outdoor installation exposed to weather conditions, and to limit overall noise level to 75dB(A) at a distance of 1 meter from the enclosure as per CPCB norms under free field conditions.

b) The construction should such that it prevents entry of rain water splashing into the enclosure and allows free & quick flow of rain water to the ground in the event of heavy rain. The detailed construction shall conform to the details as under:

c) The enclosure shall be fabricated out of the CRCA sheet of thickness not less than 1.6mm on the outside cover with inside cover having not less than 0.6mm thick perforated powder coated CRCA sheet.

d) The hinged door shall be made from not less than 16SWG(1.6mm) thick CRCA sheet and will be made air tight with neoprene rubber gasket and heavy duty locks.

e) All sheet metals parts should be processed through 7-tank process.

f) The enclosure should be powder coated.

g) Ventilation fans should be provided, exhaust piping inside the enclosure must be lagged(except bellow).

h) There should be carefully designed inlet and outlet baffles / attenuators with corresponding weather louvers and bird mesh allowing sufficient air flow, for the set to operate even under the harshest ambient conditions whilst maintaining specified noise levels. Suitably sized blower should be incorporated to meet total air requirement.

i) Temperature rise inside the enclosure should not be more than 5 Deg.C for maximum ambient above 40 Deg.C and it should be below 10 Deg.C for ambient below 40 Deg.C.

j) There should be provision for oil, coolant drain and fill.

k) The batteries should be accommodated in the enclosure in battery rack.

l) The canopy should be provided with high enclosure temperature safety device.

m) The acoustic lining should be made up of high quality insulation material i.e. rockwool/glass/mineral wool/PU foam of appropriate thickness and density for sound absorption as per standard design of manufacturer's to reduce the sound

level as per CPCB norms. The insulation material shall be covered with fine glass fiber cloth and would be supported by perforated MS sheet duly powder coated/GI sheet/ aluminium sheet.

n) The enclosure shall be provided with suitable size & no. of hinged doors along the length of the enclosure on each side for easy access inside the acoustic enclosure for inspection, operation and maintenance purpose. Sufficient space will be provided inside the enclosure on all sides of the genset for inspection, easy maintenance and repairs.

o) The canopy should be as compact as possible with good aesthetic look.

p) The complete enclosure shall be of modular construction.

q) The forced enclosure shall be as per manufacturer design using either engine radiator fan or additional blower fan(s). If the acoustic enclosure is to be provided with forced ventilation then suitable size of axial flow exhaust fan to take the hot air from the enclosure complete with necessary motors and auto start arrangement should be provided. The forced ventilation arrangement should be provided with auto stop arrangement to stop after 5 minutes of the stopping of the gen set.

r) The acoustic enclosure should be suitable for cable connection/connection through bus-trunking. Such arrangements on acoustic enclosure should be water proof and dust proof conforming to IP-65 protection. All the terminal boxes/Junction boxes etc, the battery and self starter connection terminals / and its components should be housed inside DGMS approved intrinsically safe enclosure.

s) The control panel for the Generating set should be installed separately inside the acoustic enclosure.

t) A high temperature trip system(to shut down the engine by cutting off fuel supply to the engine through the solenoid valve) with variable setting connected to a thermostatically controlled blower must be provided for eliminating excessive heat dissipated by the engine within the acoustic enclosure.

u) Suitable continuous on line Temperature Monitoring and Control System with Alarm and Shut Down Mechanism should be provided.

v) When the concentration of gas inside the acoustic enclosure reaches 10 % of LEL of gas, audio visual alarm should activate and automatic preventive measure should activate to reduce the concentration of leakage gas. These preventive measures include switching on heavy duty exhaust fan to disperse leakage gas or stoppage of gas leakage itself.

w) When the concentration of gas inside the acoustic enclosure reaches 15 % of LEL of gas (or any other suitable rating), the alternator main circuit breaker

should trip automatically and subsequently the engine should be shut down instantaneously by automatic device (i.e., cutting off power supply to the fuel solenoid valve.)

x) A separate Blower of suitable size (size/capacity to be specified in the offer) should be provided and it will be in operation even if the thermostatically controlled blower stops / fails.

y) The enclosure should be complete with power and control wiring between control panel and alternator and other components like blowers etc with proper size copper cable. The cables should be terminated using gland and tinned copper crimped type lugs and sockets. The connection from the alternator and control panel should be carried out with 3.5 cores 120 sq. mm PVC insulated, PVC sheathed armored copper cable. All control and power cabling inside the enclosure shall be well protected from mechanical damage by incorporation of MS cable duct/covered cable trays. Suitable cut out with guard gasket shall be provided in the enclosure for safe entry/exit of all cables.

z) There should be a provision of emergency shutdown of the generating set (Prime Mover) from outside the enclosure.

2. SERVICE ACCESSIBILITY:

Genset /engine control panel should be visible from outside the enclosure.

a) Routine/periodical check on engine/alternator(filter replacement and tappet setting etc) should be possible without dismantling acoustic enclosure.

b) For major repairs/overhaul, it may be required to dismantle the acoustic enclosure.

c) Sufficient space should be available around the genset for inspection and service.

3. **ENCLOSURE ILLUMINATION:**

Acoustic Enclosure Part:

A separate circuit shall be provided for lighting of the acoustic part of the enclosure. There shall be minimum 3 nos. flameproof/increased safety FTL/Bulk head glass fittings, with fluorescent 14 watt/160 watt MLL Lamp, Material- LM6, 230VAC, 50 HZ, IP-65, Lamp holder Porcelain ES-27, fitted on wall or roof of enclosure with control from non acoustic part of the enclosure. 3x2.5 sq mm stranded copper conductor, PVC insulated, PVC sheathed, 1100v grade, heavy duty, armoured cable and FLP cable glands should be used for wiring purpose inside the acoustic enclosure.

Make of Luminaire: Philips/Baliga/FCG/Sudhir

Light will be switched from one MCB, 6amp, C curve, mounted on control panel cover & have back-up HRC fuse and neutral link of 6 amp rating.

Make: Legrand/ Merlin-Gerin/reputed brand for MCB

Non Acoustic Enclosure Part:

A separate circuit shall be provided for lighting of NON acoustic part of enclosure. Power for the lighting circuit shall be taken from the incoming switch in the control panel through backup HRC fuse & neutral link of 16 Amp rating. Non-acoustic enclosure shall have 2(Two) nos. of 1x18 Watt Tube light luminaires suspended with rigid supports from the roof or wall. These luminaires shall be wired with heavy duty PVC insulated, PVC sheathed, armoured, 3x 2.5sqmm stranded copper cables. Lights should be switched from individual 6 Amp, C curve, MCBs, mounted on the front cover of the control panel. One no. industrial type metallic plug socket of 20 Amp rating with 10 Amp SP MCB for switching shall be provided which shall be mounted on the side of the enclosure and fed from the lighting circuit.

Make of Luminaire: Philips

Make of Metallic plug & socket: Legrand / Merlin Gerin

Make of MCB: Legrand / Merlin Gerin/reputed brand

NOTE:

(i) Bidders should submit layout drawing of the acoustic enclosure indicating positions of engine, alternator etc along with the wiring diagram of the package and will have to be approved by OIL before execution of the order.

(ii) Enclosure design should be such that for any major maintenance activities the enclosures from any side can be easily dismantled and re-erected.

(iii) Generating set comprising of Engine, Alternator, and other auxiliaries should be placed inside an acoustic enclosure (approved by ARAI, Pune/ NPL, New Delhi/ NSTL, Visakapatnam/ FCRI, Palghat / NAL, Bangalore) and the unit should be mounted to a common base frame. The set should have proper arrangement for easy loading /unloading to facilitate ease in transportation.

(v) A panel viewing window should be provided to facilitate visual monitoring of the equipment from outside.

4. ENCLOSURE EARTHING ARRANGEMENT

Two nos. of 50x6 mm GI straps (earth bus) shall be provided inside the enclosure and fixed on the skid floor. The panel earth loops from alternator, control panel, changeover panel, auxiliary motors (if provided) shall be connected to these straps with two distinct and independent GI earth straps of sufficient size as per IS 3043. Earth leads and earthing jobs as per IS-3043. Suitable studs with fastener arrangement shall be provided on the earth buses for connection of earth straps to outside earth electrodes.

(Generator neutral shall be earthed through separate neutral grounding resistor with control panel. NGR is not in the scope of this supply).

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EQUIPMENT DATA SHEET

The following equipment data shall be furnished by the bidder for submission along with the technical bid:

Sl. No	Description of Data sought	DATA	Remarks(if any)
	GENERATOR SET		
1	Typical Maximum Prime Power Rating at 50Hz(0.8 P.F.),kW:		
2	Output Voltage and Frequency:		
3	Power Factor:		
4	No. of Phases:		
5	Over all Dimensions, MM:		
6	Dry Weight:		
7	Performance in 40^0C air, 150 MSL, Prime power rating at 0.8 power factor (KW)/ kVA rating:		
8	Fuel consumption at standard conditions for: 50%, 75% and 100% load		
9	Exhaust gas components; % NOX, % SO, Tons particulate/yr/mo at 50%, 100% load		
10	Verification of 10% overload capability		
	ENGINE		
1	Type/Model:		
2	No. of cylinders:		
3	Aspiration:		
4	Bore:		
5	Stroke:		
6	Displacement, Liter:		
7	Engine Output Prime, kWm(Max):		
8	Piston Speed, m/s:		
9	Brake Mean Effective Pressure(BMEP), kPa:		
10	Engine Rating(BHP) at 1500RPM and Piston Compression Ratio:		
11	Natural Gas Consumption for Gas Calorific Value: (970BTU/CFT or 8632kCal/M3)SCM/Hr.		
12	Exhaust Temperature(Stack)^{0}C		
13	Energy Input, kW:		
14	Energy Output, kW:		
15	Heat Rejected to Jacket Water, kW:		
16	Heat Rejected to After-cooler LTA Circuit, kW:		
17	Heat Rejected to Exhaust, kW:		
18	Heat Rejected to Ambient+ Unaccounted, kW:		
19	Air Flow in Liter/sec:		
20	Exhaust Gas Flow, Liter/sec:		
21	Exhaust System Permissible Back Pressure, mm Hg:		
22	Engine Water Flow, Liter/Min:		
23	After Cooler Circulating Water Flow, Liter/Min:		

24	Raw Water for Engine Side Heat Exchanger, Liter/Min:		
25	Raw Water for After Cooler Heat Exchanger, Liter/Min		
26	Recommended Cooling Tower Capacity, TR:		
27	Main Line Pipe size, MM:		
28	Main Line Gas Pressure, Kg/CM2		
29	Engine Dimension, LxBxH:		
30	Dry Weight of the Engine without Cooling System:		
31	Governing system		
32	Type of governor		
33	Accuracy		
34	Engine protection details		
35	Method of starting		
	HEAT EXCHANGER COOLING TOWER		
1	Model/Type		
2	Coolant Capacity		
3	Horse power required to run the radiator fan		
	ALTERNATOR		
1	Make's name		
2	Rated kva		
3	Power factor		
4	Rated voltage		
5	Rated current		
6	Speed in rpm		
7	Frequency		
8	No. Of phase		
9	Over load capacity		
10	Class Of insulation		
11	Type of enclosure		
12	Voltage regulation		
13	Direction of rotation		
14	Type of bearing		
15	RTD's provided (no)		
16	Model		
17	Frame		
18	Insulation class		
19	Number of Leads		
20	Weight, total		
21	Weight, rotor		
22	Air Flow		
23	At rated voltage:		
24	Efficiency at 0.8 power factor for: 50% load, 75% load, 100% load		
25	Fault current, 3 phase symmetrical		
26	Decrement curve		

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ANNEXURE II

BID EVALUATION (BEC)/BID REJECTION CRITERIA (BRC)

BID REJECTION CRITERIA (BRC):

The bid must conform to the specifications, terms and conditions given in the tender specifications. Bids shall be rejected in case the items offered do not conform to the required minimum / maximum parameters stipulated in the technical specifications and to the respective international /national standards wherever stipulated. Notwithstanding the general conformity of the bids to the stipulated specifications and terms and conditions, the following requirements shall have to be particularly met by the bidders, without which the offer will be considered as non-responsive and rejected.

(A) TECHNICAL :

1.0 **Bidder's Eligibility:**

1.1 Bidder shall be an Original Equipment Manufacturer (OEM) or an authorized dealer of OEM of all or any one the following three items -

i) Engine
ii) Alternator and
iii) Generator Set Complete

OR

An OEM approved assembler of Generating Set or an authorized dealer of the OEM approved assembler.

1.2 In case the bidder is an OEM of Engine or its authorized dealer, Alternator shall be purchased from the OEM of Alternator or its authorized dealer and vice versa.

1.3 In case the bidder is an OEM approved assembler of Generating set, the Engine and the Alternator shall be purchased from respective OEM or their authorized dealers.

1.4 The bidder shall submit OEM Certificate / Assembler Certificate /Authorized Dealership Certificate from principal/ as the case may be along with the technical bid. Offer will be summarily rejected in case of failure to submit valid certificate.

1.5 The bidder or its principal should have after-sales service center in India for the engine. The bidder is required to submit documentary evidence in support of the presence of after-sales service center in India along with the technical bid.

2.0 **Bidder's Experience**:

2.1 Bidder should have the experiences of supply, installation and commissioning of minimum 3(three) orders for gas engine driven generating sets of capacity 250KVA or more to organizations namely PSUs (State/Central Government of India) or State/Central Govt. Deptt. of India or any other Public Limited Company during the last 10(Ten) years before the bid closing date of this tender.

2.2 Documentary evidence in respect of the above should be submitted in the form of copies of relevant Purchase Orders and invoices along with copies of any of the documents in respect of satisfactory execution of each of those Purchase Orders such as (i) Satisfactory Inspection report (ii) Satisfactory supply completion / Installation report.

3.0 The Alternator shall be brushless type.

4.0 The engine shall be of four-stroke cycle, spark-ignited, turbocharged after-cooled gas engine with heat exchanger-cooling tower cooling, designed in accordance with standards ISO: 3046/BS: 5514/IS: 10000, capable of operating without any external ventilation system at the site conditions given in the technical specifications and developing rated output power in the range of 570 - 600BHP gross at 1500RPM and compression ratio not exceeding 12:1.

The bidder shall provide undertaking from the engine OEM certifying the rated output vis-a-vis compression ratio and RPM of the engine.

5.0 The power density of the engine shall not exceed 11.0 kWe per liter of displacement volume and Single Step block load capability shall be at least 60% of its rated capacity.

The bidder shall provide undertaking from the engine OEM/Generator Set Assembler certifying the block load capability of the engine/generator.

6.0 The make & model of the engine of the offered generator set should be proven in oil & gas field application in India and minimum 2(two) nos. of the engines in generator set application should be presently running in oil & gas fields of India with on-site field gas as fuel and must have logged more than 3000 running hours each from its date of commissioning prior to the bid closing date of this tender.

The bidder should provide satisfactory performance report of the two generator sets certifying the performance of the engines and running hours logged as proven track record from the owner or its representative of the generator sets.

7.0 The bidder shall submit undertaking and confirmation from OEM that the equipment to be supplied are not going to become obsolete for the next 10 years at the least and provisioning of spares will be continued.

(B) <u>COMMERCIAL</u> :

1.0 Bids are invited under Single Stage Two Bid System. Bidders shall quote accordingly under Single Stage Two Bid System. Please note that no price details should be furnished in the Technical (i.e. Unpriced) bid. The “Unpriced Bid” shall contain all techno-commercial details except the prices which shall be kept blank. The “Priced Bid” must contain the price schedule and the bidder’s commercial

terms and conditions. Bidder not complying with above submission procedure will be rejected.

2.0 **Bid security of US $ 36,700.00 or Rs. 16,50,000.00** shall be furnished as a part of the TECHNICAL BID (refer Clause Nos.9.0 & 12.0 (Section A) of "General Terms & Conditions" for e-Procurement as per Booklet No. MM/GLOBAL/E-01/2005 for E-procurement (ICB Tenders)). **Any bid not accompanied by a proper bid security in ORIGINAL will be rejected without any further consideration.** A bid shall be rejected straightway if Original Bid Security is not received within the stipulated date & time mentioned in the Tender and/or if the Bid Security validity is shorter than the validity indicated in Tender and/or if the Bid Security amount is lesser than the amount indicated in the Tender.

2.1 For exemption for submission of Bid Security, please refer Clause No. 9.8 (Section A) of "General Terms & Conditions" for e-Procurement as per Booklet No. MM/GLOBAL/E-01/2005 for E-procurement (ICB Tenders).

2.2 The Bid Security shall be valid for one year from the date of tender opening i.e**, valid upto 21.04.2016.**

3.0 Validity of the bid shall be minimum 180 days from Bid closing date. Bids with lesser validity will be straightway rejected.

4.0 The prices offered will have to be firm through delivery and not subject to variation on any account. A bid submitted with an adjustable price will be treated as non-responsive and rejected.

5.0 Bids received after the bid closing date and time will be rejected. Similarly, modifications to bids received after the bid closing date & time will not be considered.

6.0 Bidders shall quote directly and not through Agents in India. Offers made by Indian Agents on behalf of their foreign principals will be rejected. Similarly offers from unsolicited bidders will be rejected.

7.0 Bids containing incorrect statement will be rejected.

8.0 No offers should be sent by E-mail or Fax. Such offers will not be accepted.

9.0 Bidders must confirm that Goods, materials or plant(s) to be supplied shall be new of recent make and of the best quality and workmanship and shall be guaranteed for a period of eighteen months from the date of shipment/dispatch or twelve months from the date of commissioning whichever is earlier against any defects arising from faulty materials, workmanship or design. Defective goods/materials or parts rejected by OIL shall be replaced immediately by the supplier at the supplier's expenses and no extra cost to OIL.

10.0 Successful bidder will be required to furnish a Performance Bank Guarantee @10% of the order value. The Performance Bank Guarantee must be valid for one year from the date of receipt/acceptance of goods or 18 months from the date of shipment whichever is earlier. Bidder must confirm the same in their Technical Bid. Offers not complying with this clause will be rejected.

11.0 Bidders are required to submit the summary of the prices in their commercial bids as per bid format (Summary), given below :

(i) <u>Commercial Bid Format (SUMMARY) for Foreign Bidders</u> :

(A) Total material cost of 6 nos. Gen sets with Accessories
(B) Cost of Commissioning spares, if any, for all Gen sets
(C) Cost of 2 years Operation and Maintenance Spares for all Gen sets
(D) Grand Total Material Cost, (A + B + C)
(E) Packing & FOB Charges
(F) Total FOB Port of Shipment value, (D + E) above
(G) Ocean Freight Charges upto Kolkata, India
(H) Insurance Charges
(I) Total CIF Kolkata value, (F + G + H)
(J) Pre-despatch Inspection & Testing (by OIL) charges, if any
(K) Installation & Commissioning charges inclusive of service tax
(L) Training charges, if any, inclusive of service tax
(M) Total Value, (I + J + K + L) above
(N) Total value in words :
(O) Gross Weight :
(P) Gross Volume

(ii) <u>Commercial Bid Format (SUMMARY) for Indigenous Bidders</u> :

(A) Total material cost of 6 nos. Gen sets with Accessories
(B) Cost of Commissioning spares, if any, for all Gen sets
(C) Cost of 2 years Operation and Maintnance Spares for all Gen sets
(D) Grand Total Material Cost, (A + B + C)
(E) Packing and Forwarding Charges
(F) Total Ex-works value
(G) Excise Duty, (Please indicate applicable rate of excise duty)
(H) Sales Tax, (Please indicate applicable rate of Tax)
(I) Total FOR Despatching station price, (F + G + H)
(J) Road Transportation charges to Duliajan
(K) Insurance Charges
(L) Total FOR Duliajan value, (I + J + K)
(M) Pre-despatch Inspection & Testing (by OIL) charges, if any
(N) Installation & Commissioning charges inclusive of service tax
(O) Training charges, if any, inclusive of service tax
(P) Total Value, (L + M + N + O) above
(Q) Total value in words :
(R) Gross Weight :
(S) Gross Volume :

NOTE :

1. Cost of individual items must be quoted separately.
2. The Commissioning Spares and 2 years Operation and Maintenance Spares should also be quoted separately indicating the unit price and quantity quoted.
3. The items covered under this enquiry shall be used by OIL in the PEL/ML areas issued/renewed after 01/04/99 and hence, applicable Customs Duty for import of goods shall be ZERO. Indigenous bidders must quote Deemed Export prices. Excise Duty under Deemed Export exempted.

12.0 Pre-Despatch / Shipment Inspection & Testing charges, if any, shall be quoted on lumpsum basis separately which shall be considered for commercial evaluation of the offers. However, all to and fro fares, boarding/lodging and other expenses of OIL's Inspection Engineer(s) shall be borne by OIL.

13.0 Installation/Commissioning and Training charges must be quoted separately on lumpsum basis which shall be considered for evaluation of the offers. These charges should include amongst others to and fro fares, boarding/lodging, local transport at Duliajan and other expenses of supplier's commissioning/training personnel during their stay at Duliajan, Assam(India).

Bidders must categorically indicate the above charges in their commercial offers and must confirm the same in their Technical bids.

14.0 Offers should be submitted with **Integrity Pact** duly signed by the authorized signatory of the bidder. If any bidder refuses to sign Integrity Pact or declines to submit Integrity Pact with the offer, their bid shall be rejected straightway.

(II) BID EVALUATION CRITERIA (BEC) :

The bids conforming to the specifications, terms and conditions stipulated in the enquiry and considered to be responsive after subjecting to the Bid Rejection Criteria will be considered for further evaluation as per the Bid Evaluation Criteria given below:

A. **COMMERCIAL** :

1.0 The evaluation of bids will be done as per the Commercial Bid Format (SUMMARY) detailed vide Para 11.0 of BRC.

2.0 If there is any discrepancy between the unit price and the total price, the unit price will prevail and the total price shall be corrected. Similarly, if there is any discrepancy between words and figure, the amounts in words shall prevail and will be adopted for evaluation.

3.0 For conversion of foreign currency into Indian currency, B.C. selling (Market) rate declared by State Bank of India, one day prior to the date of price bid opening shall be considered. However, if the time lag between the opening of the bids and final decision exceed 3(three) months, then B.C. Selling(Market) rate of exchange declared by SBI on the date prior to the date of final decision shall be adopted for conversion and evaluation.

4.0 To ascertain the inter-se-ranking, the comparison of the responsive bids will be made as under, subject to corrections / adjustments given herein.

4.1 When only foreign bidders are involved :

Comparison of bids will be done on the basis of "TOTAL VALUE" which is estimated as under :

(A) Total material cost of 6 nos. Gen sets with Accessories
(B) Cost of commissioning spares, if any, for all Gen sets
(C) Cost of 2 years Operation and Maintenance Spares for all Gen sets
(D) Packing & FOB Charges
(E) Total FOB Port of Shipment value, (A+ B +C+D) above
(F) Ocean Freight Charges upto Kolkata, India
(G) Insurance Charges @ 1% of Total FOB Value vide (E) above
(H) Banking Charges @ 0.5% of Total FOB Value vide (E) above in case of payment through Letter of Credit (If confirmed L/C at buyer's account is required, 1.5% of Total FOB Value will be loaded)
(I) Total CIF Kolkata Value, (E+F +G+H) above
(J) Pre-shipment Inspection charges, if any .
(K) Installation & Commissioning charges inclusive of service tax
(L) Training charges, if any, inclusive of service tax
(M) Total Value, (I + J + K + L) above
(N) Total value in words :

NOTE : Banking charge in the country of the foreign bidder shall be borne by the bidder.

4.2 When only domestic bidders are involved or when more than one domestic bidders are in contention in case of mixed response :

Comparison of bids will be done on the basis of "TOTAL VALUE" which is estimated as under :

(A) Total material cost of Gen set with Accessories
(B) Cost of commissioning spares, if any, for all Gen sets
(C) Cost of 2 years Operation and Maintenance Spares for all Gen sets
(D) Packing and Forwarding Charges
(E) Total Ex-works value, (A + B +C+D) above
(F) Excise Duty including Cess
(G) Sales Tax

(H) Total FOR Despatching station price, (E +F+G)
(I) Road Transportation charges to Duliajan
(J) Insurance Charges @0.5% of Total FOR Despatching Station Value (H) above
(K) Total FOR Duliajan value, (H +I +J)
(L) Assam Entry tax
(M) Pre-shipment Inspection charges, if any.
(N) Installation & Commissioning charges inclusive of service tax
(O) Training charges, if any, inclusive of service tax
(P) Total Value, (K+L+M +N+O) above
(Q) Total value in words :

NOTE: Excise Duty in case of the indigenous bidder is EXEMPTED under deemed Export.

4.3 When both foreign and domestic bidders are involved :

The Total Value of domestic bidder (inclusive of customs duty on imported raw material and components etc, and applicable terminal excise duty on the finished products and Sales Tax) excluding inland transportation to destination, Assam Entry Tax and Insurance charges worked out as per Para 4.2 above and Total Value of the foreign bidder worked out as per Para 4.1 above will be compared. No price preference will be allowed to indigenous bidders except that for capital goods, the domestic manufacturers would be accorded a price preference to offset CST to the extent of 4 % or actuals, whichever is less subject to 30 % local content norms as stipulated for World Bank Funded project to the satisfaction of OIL. When more than one domestic bidders fall within price preference range, inter-se-ranking will be done on Total Value basis.

Note: If the Government of India revises these evaluation criteria the same as applicable on the bid closing date will be adopted for evaluation of the offers.

5.0 Other terms and conditions of the enquiry shall be as per General Terms and Conditions for Global Tender. However, if any of the Clauses of the Bid Rejection Criteria / Bid Evaluation Criteria (BEC / BRC) mentioned here contradict the Clauses in the General Terms & Conditions of Global Tender of the tender and/or elsewhere, those mentioned in this BEC / BRC shall prevail.

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ANNEXURE-III

CHECK LIST

(A) TECHNICAL:

The following checklist must be completed and returned with the offer. Please ensure that all these points are covered in your offer. These will ensure that your offer is properly evaluated. Please tick mark #Yes# or #No# to the following question, in the right

Sl. No.	Check List item	YES/NO
1	Whether quoted as OEM of Engine and whether documentary evidence submitted?	YES/NO
2	Whether quoted as OEM of Alternator & whether documentary evidence submitted?	YES/NO
3	Whether quoted as Authorized Dealer of OEM (Engine/Alternator) and whether documentary evidences submitted?	YES/NO
4	Whether quoted as Assembler (OEM of Gen Set manufacturer) or authorized dealer of Assembler (Gen Set Manufacturer) and whether documentary evidences submitted?	YES/NO
5	Whether After-sale Service Center for the engine offered located in India?	YES/NO
6	Whether clauses of the technical bid is responded clause-wise	YES/NO
7	Whether deviation (if any) from the technical specification are highlighted clause wise?	YES/NO
8	Whether detail specification of engine with manufacturer's technical literature/catalogue enclosed?	YES/NO
9	Whether detail specification of Alternator with manufacturer's technical literature/catalogue enclosed?	YES/NO
10	Whether test certificate of Alternator and Control Panel will be submitted?	YES/NO
11	Whether power and Wiring diagram of Alternator Control Panel submitted?	YES/NO
12	Whether bill of Materials of Control Panel submitted?	YES/NO
13	Whether confirmed that control panel drawing shall be approved by OIL before manufacturing in the event of placement of order?	YES/NO
14	Whether offered engine is as per NIT specifications?	YES/NO
15	Whether quoted for supply, installation, commissioning & Test run at site of generator set?	YES/NO
16	Whether the Generator Set is rated for 500kVA at 0.8PF, 415Volts AC 3 Phase 50Hertz Prime Duty?	YES/NO
17	Whether the engine and the Gen set design is as per ISO 3046/BS5514/IS10000/ISO8528 standards?	YES/NO
18	Whether documentary evidences i.e. (i) Purchase Order Copies, (ii) Invoices, (iii) Satisfactory supply completion / Installation report for the supplies made against the past three orders for gas engine driven generator sets submitted with the technical bid?	YES/NO
19	Whether information pertaining to past three orders(Purchase order) for gas engine driven generator sets submitted in tabular format with the following details?: (i) Purchase order No. with Order	YES/NO

	Date (ii) Order Quantity with capacity of Generator Set (iii) Make and Model of the engine and (iv) Customer Name with address and contact no. to whom the supplies was made.	
20	Whether satisfactory performance report of the offered engine model in generator set application in oil/gas field application with onsite field gas as fuel and cumulative running hours logged by the engine with purchase order copy, invoice submitted with the technical bid?	YES/NO
21	Whether undertaking and confirmation from OEM that the equipment to be supplied are not going to become obsolete for the next 10 years and whether spare parts for 10 years shall continued to be supplied at the least?	YES/NO
22	Whether undertaking from the engine OEM/Generator Set Assembler certifying the block load capability of the engine/generator submitted with the technical bid?	
23	Whether undertaking from the engine OEM certifying the rated output vis-a-vis compression ratio and RPM of the engine submitted with the technical bid?	
24	Whether undertaking from the engine manufacturer in support of the engine rating and output is submitted?	YES/NO
25	Whether three sets of Composite Operation Manual for the Generator Set Complete and Trouble Shooting Chart shall be supplied along with the Order?	YES/NO
26	Engine Shop Manual (Engine Rebuilding Manual) and Parts Manual shall be supplied with the Order?	YES/NO
27	Whether spare parts of engine, gas train etc for two years operation and maintenance will be supplied along with the order and list of such spares submitted with the technical bid?	YES/NO
28	Whether the content of this Check List is read and responded?	YES/NO

ANNEXURE III

(B) COMMERCIAL CHECK LIST

THE CHECK LIST MUST BE COMPLETED AND RETURNED WITH YOUR OFFER. PLEASE ENSURE THAT ALL THESE POINTS ARE COVERED IN YOUR OFFER. THESE WILL ENSURE THAT YOUR OFFER IS PROPERLY EVALUATED. PLEASE SELECT "Yes" OR "No" TO THE FOLLOWING QUESTIONS, IN THE RIGHT HAND COLUMN.

Sl#	REQUIREMENT	COMPLIANCE
1.0	Whether bid submitted under Single Stage Two Bid System?	Yes / No
2.0	Whether quoted as manufacturer?	Yes / No
2.1	Whether quoted as OEM Dealer / OEM Approved Assembler. To Specify-	Yes / No

2.2	If quoted as OEM Dealer / OEM Approved Assembler,	Yes / No
	(a) Whether submitted valid and proper authorization letter from manufacturer confirming that bidder is their authorized Dealer / Approved Assembler for the product offered ?	
	(b) Whether manufacturer's back-up Warranty/Guarantee certificate submitted?	
3.0	Whether ORIGINAL Bid Bond (not copy of Bid Bond) as per Revised Format(Annexure VII Revised) Sent separately? If YES, provide details	
	(a) Amount :	
	(b) Name of issuing Bank :	
	(c) Validity of Bid Bond :	
4.0	Whether offered firm prices ?	Yes / No
4.1	Whether quoted offer validity of 180 days from the date of closing of tender?	Yes / No
4.2	Whether quoted a firm delivery period?	Yes / No
4.3	Whether agreed to the NIT Warranty clause?	Yes / No
4.4	Whether confirmed acceptance of tender Payment Terms of 80% against shipment/dispatch documents and balance 20% after successful commissioning along with commissioning charges?	Yes / No
5.0	Whether confirmed to submit PBG as asked for in NIT?	Yes / No
5.1	Whether agreed to submit PBG within 30 days of placement of order?	Yes / No
6.0	Whether Price submitted as per Price Schedule (refer Para 11.0 of BRC vide Annexure – II)?	Yes / No
7.0	Whether cost of Recommended Spares for 2 years of operations quoted?	Yes / No
7.1	Whether confirmed that all spares & consumables will be supplied for a minimum period of **10 years** ?	Yes / No
8.0	Whether quoted as per NIT (without any deviations)?	Yes / No
8.1	Whether quoted any deviation?	Yes / No

8.2	Whether deviation separately highlighted?	Yes / No
8.3	Whether indicated the country of origin for the items quoted?	Yes / No
8.4	Whether technical literature / catalogue enclosed?	Yes / No
8.5	Whether weight & volume of items offered indicated?	Yes / No
9.0	For Foreign Bidders - Whether offered FOB / FCA port of despatch including sea / air worthy packing & forwarding?	Yes / No
9.1	For Foreign Bidders – Whether port of shipment indicated. To specify:	Yes / No
9.2	For Foreign Bidders only - Whether indicated ocean freight up to Kolkata port (Excluding marine insurance) ?	Yes / No
9.3	Whether Indian Agent applicable ?	Yes / No
	If YES, whether following details of Indian Agent provided?	
	(a) Name & address of the agent in India – To indicate	
	(b) Amount of agency commission – To indicate	
	(c) Whether agency commission included in quoted material value?	
10.0	For Indian Bidders – Whether indicated the place from where the goods will be dispatched. To specify :	Yes / No
10.1	For Indian Bidders – Whether road transportation charges up to Duliajan quoted?	Yes / No
10.2	For Indian Bidders only - Whether offered Ex-works price including packing/forwarding charges?	Yes / No
10.3	For Indian Bidders only - Whether indicated import content in the offer?	Yes / No
10.4	For Indian Bidders only - Whether offered Deemed Export prices?	Yes / No
10.5	For Indian Bidders only – Whether all applicable Taxes & Duties have been quoted?	Yes / No
11.0	Whether all BRC/BEC clauses accepted ?	Yes / No
12.	Whether confirmed to offer the equipment for Pre-	Yes / No

0	despatch/shipment Inspection & testing?	
12.1	Whether Pre-despatch/shipment inspection & testing charges applicable?	Yes / No
12.2	If Pre-despatch/shipment inspection & testing charges applicable, whether quoted separately on lumpsum basis?	Yes / No
12.3.	Whether confirmed to carry out Installation & Commissioning of the equipment at Duliajan(Assam) ?	Yes / No
12.4	Whether Installation & Commissioning charge applicable?	Yes / No
12.5	If Installation/ Commissioning and Training charges applicable, whether separately quoted on lumpsum basis?	Yes / No
12.6	Whether to & fro air fares, boarding/lodging of the commissioning personnel at Duliajan, Assam(India) included in the quoted charges ?	Yes / No
12.7	Whether confirmed that all Service, Income, Corporate tax etc. applicable under Installation/ Commissioning & Training are included in the prices quoted ?	Yes / No
13.0	Whether Integrity Pact with digital signature uploaded?	Yes / No
13.1	Whether all the clauses in the Integrity Pact have been accepted?	Yes / No

Signature _____

Name _____

Designation _____

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