OIL INDIA LIMITED
(A Govt. of India Enterprise)
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CORRIGENDUM AGAINST TENDER NO SKI 3432P17 dtd 26.12.16

1.0 B. C. Date & time of tender no. SKI 3432 P17 dtd 26.12.2016 for supply , installation & commissioning of Diesel engine driven Generating set has been extended to 28.02.2017 at 11:00 hrs (IST).

2.0 Annexure A, I, II and V has been amended as under instead of existing: -

REVISED ANNEXURE-A

Tender No& Date : SKI 3432 P17/03 DATED 26.12.2016

OIL INDIA LIMITED invites Indigenous tenders for items detailed below:

TECHNICAL SPECIFICATIONS WITH QUANTITY

SLNO & MATERIAL CODE NO.	MATERIAL DESCRIPTION.	QUANTITY	UOM
10 ---------- 0C000242	Detail specifications are attached with this tender as below: 1. ANNEXURE-I :SPECIFICATIONS OF DED GENERATOR SET 2. ANNEXURE II: SPECIFICATION OF ELECTRICAL ITEMS 3. ANNEXURE III: SPECIFICATION OF ACOUSTIC ENCLOSURE 4. ANNEXURE-IV EQUIPMENT DATA SHEET 5. ANNEXURE-V TECHNICAL CHECK LIST (FOR	1	NO

	BIDDER)		
20	INSTALLATION AND COMMISSIONING OF ONE NO SILENT DIESEL ENGINE DRIVEN GENERATOR SET.	1	AU

Special Terms & conditions:-

1) The offered DG set should have valid Type Approval / Conformity of Production Certificate from Certification Agencies as per latest CPCBII notification for Noise Limit. A copy of the same has to be furnished along with the offer.

Also certificate/conformity number alongwith equipment(engine&alternator details) are to be displayed suitably as per the acccordance of CPCB .

[Certification agencies/Authorised agencies of certification are-1)ARAI,Pune,2) Naval Science & Technology Laboratory, Visakhapatanam ,3). Fluid Control Research Institute, Palghat ,4). National Aerospace Laboratory, Bangalore; 5). International Centre for Automotive Technology, Manesar, Haryana ,6). National Test House (Northern Region), Ghaziabad, Uttar Pradesh].

2). OIL's Purchase Order No must be permanently marked on two sides of the enclosure in 8 Inch (200MM) sized lettering.

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

I) 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 The Diesel engine should be a proven engine of generating set application with a four stroke, Multi cylinder, naturally aspirated /Turbocharged, air cooled/water cooled , inline engine , conforming to ISO 3046 / BS 5514 / IS 10000 or relevant standards and capable of developing a net Horse Power(at 1500 rpm) require to drive

a generating set of capacity in the range 330 KVA – 400 KVA rated for Emergency Standby Duty (ESP) as per ISO 8528 standard.

1.1 Certification/declaration to be enclosed from the engine OEM, mentioning the net HP available to drive the alternator and compliance of above standard. In this regard the copy of such record to be furnished as per the following:

a. Certificate from OEM(engine) mentioning the net BHP

b. Proven certificate of the engine for generating set application from OEM(Engine).

2.0 330 KVA – 400 KVA Diesel generating sets should be enclosed in Acoustic Enclosure, and meet the latest CPCB norm. (Copy of documents/certificates for due Compliances of the relevant norms to be enclosed).

Note: The latest version of the emission norm as applicable, shall be valid for evaluation purpose.

3.0 The Alternator must be brushless type.

4.0 The bidder must undertake and confirm from OEM that the equipment to be supplied are not going to become obsolete for the next 10 years and provisioning of spares will be continued.

Note: Relevant documentary evidences in support of conditions mentioned in support of Sl no 1 to 4(as applicable) must be duly enclosed with the offer failing which the offer shall be summarily rejected.

5.0) Bidder should have experience of successfully executing at least 1 (one) similar order of value Rs 21,93,272.00 during the last 5 (five) years as on the original Bid Closing Date of the tender.

Note:

(i) Similar Order means Purchase Order against supply, installation, commissioning and testing of Diesel Engine driven Generating sets of capacity 250 KVA or above along with the Control Panels and accessories in Government/Semi Government/PSU or any Public Limited Company.

(ii) In case the bidder submit documentary evidences of more than one Purchase Order in support of the bid, then the total value of the Purchase Orders should be atleast Rs 21,93,272.00 during the last 5 (five) years as on the original Bid Closing Date of the tender.

(iii) The bidder must submit the following as documentary evidence (attested/self attested) in support of the experience:

a. For OIL Purchase Order, copy of "Purchase Order" of completed supply must be submitted as per BRC Clause 5.0 above.

b. For supply to other Govt/Semi Govt/PSU or Public Limited Company, copy (s) of Purchase Order of the supply along with invoice against the purchase order or Completion certificate of the supply from the end user are/ is to be submitted.

c. In case the bidder submit Completion certificate from the end user, the completion certificate should clearly mention the Purchase Order No(s), Total Value of Supply and complete description of the supplied item.

6.0) Bidder's Qualification:

6.1 Bidder may be an Original Equipment Manufacturer (OEM) of Generating set/Engine/Alternator.

OR

Bidder may be an authorized dealer of OEM for the Engine/Alternator /Generating set.

OR

Bidder may be an OEM approved assembler of Generating set or its authorised dealer.

6.2 In case the bidder is an OEM of Engine or their authorized dealer, Alternator must be purchased from the OEM of Alternator or their authorized dealer and vice versa.

OR

In case the bidder is an OEM approved assembler of Generating sets, Engine and Alternator must be purchased from OEM or their authorized dealers.

Note: But whatever may be their status in para 6.1 & 6.2 above, bidder will have to enclose Documentary evidence along with the offer, failing which offer will be rejected.

7.0) OIL will not be responsible for delay, loss or non receipt of applications (for bidding documents) sent by mail and will not entertain any correspondence in this regard.

B) FINANCIAL:

1.0 Annual Financial Turnover of the bidder during **any of preceding three financial / accounting years from the original bid closing date** should be at least Rs 21,93,272.00/-.

1.1 **Net worth** of bidder must be positive for preceding financial/ accounting year.

2.0 Considering the time required for preparation of Financial Statements, if the last date of preceding financial / accounting year falls within the preceding six months reckoned from the original bid closing date and the Financial Statements of the preceding financial / accounting year are not available with the bidder, then the financial turnover of the previous three financial / accounting years excluding the preceding financial / accounting year will be considered. In such cases, the Net worth of the previous financial / accounting year excluding the preceding financial / accounting year will be considered.

3.0 However, the bidder has to submit an affidavit/undertaking certifying that 'the balance sheet/Financial Statements for the financial year..... (*as the case may be*) has actually not been audited so far'.

Note:

a) For proof of Annual Turnover & Net worth any one of the following document must be submitted along with the bid:-

i) A certificate issued by a practicing Chartered/ Cost Accountant (with Membership Number and Firm Registration Number), certifying the Annual turnover & Net worth as per format prescribed in ANNEXURE- B.

OR

ii) Audited Balance Sheet along with Profit & Loss account.

b) In case the bidder is a Central Govt. Organization/PSU/State Govt. Organization/Semi-State Govt. Organization or any other Central/State Govt. Undertaking, where the auditor is appointed only after the approval of Comptroller and Auditor General of India and the Central Government, their certificates may be accepted even though FRN is not available. However, bidder to provide documentary evidence for the same.

C) <u>COMMERCIAL:</u>

1.0 Bids are invited under **Single Stage Composite Bid** System.

2.0 Bid security of Rs. 88,000.00 shall be furnished as a part of the TECHNICAL BID (refer Clause No. 8.0 (Section A) of "General Terms & Conditions" for e-Procurement as per Booklet No. MM/CALCUTTA/E-01/2016 for E-procurement (LCB Tenders)).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. 8.16 (Section A) of "General Terms & Conditions" for e-Procurement as per Booklet No. MM/CALCUTTA/E-01/2016 for E-procurement (LCB Tenders).

2.2 The Bank Guarantee towards Bid Security shall be valid **upto 31.07.2017.**

3.0 Successful bidder will be required to furnish a Performance Bank Guarantee @10% of the order value. The Performance Bank Guarantee must be valid for a period of 18 months from the date of despatch or twelve(12) months from the date of receipt of the items at site, whichever is earlier. Bidder must confirm the same in their Technical Bid. Offers not complying with this clause will be rejected.

4.0 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 18 months from the date of despatch or twelve(12) months from the date of receipt of the items at site, 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 at no extra cost to OIL.

6.0 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.

7.0 Validity of the bid shall be minimum **90 days from the Bid Closing Date**. Bids with lesser validity will be rejected.

8.0 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.

9.0 Bids containing incorrect statement will be rejected.

10.0 No offers should be sent by Telex, Cable, E-mail or Fax. Such offers will not be accepted.

11.0 All the Bids must be Digitally Signed using "Class 3" digital certificate (e-commerce application) with Bidder's organization name as per Indian IT Act obtained from the licensed Certifying Authorities operating under the Root Certifying Authority of India (RCAI), Controller of Certifying Authorities (CCA) of India. The bid signed using other than "Class 3" digital certificate with Bidder's organization name, will be rejected.

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

Sl. No.	Item	Rupees
(A)	Total material cost	
(B)	Packing and Forwarding Charges	
(C)	Total Ex-works value, (A+B)	
(D)	Excise Duty including Cess	
(E)	Sales Tax, (Please indicate applicable rate of Tax)	
(F)	Total FOR Despatching station price, (C+D+E)	
(G)	Road Transportation charges to Duliajan, Assam	
(H)	Insurance Charges @0.5% of Total For Despatching Station Value (F) above	
(I)	Assam Entry Tax (wherever applicable)	
(J)	Total FOR Duliajan value, (F+G+H+I)	
(H)	Installation & Commissioning charges including Service Tax	
(I)	TOTAL VALUE (J+H)	
Total value in words : Rupees		

II) BID EVALUATION CRITERIA

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 mentioned below:

1.0 The evaluation of bids will be done as per the Price Schedule (SUMMARY) detailed vide Para 12.0 of Bid Rejection Criteria.

2.0 In the event of computational error between unit price and total price, unit price shall prevail and adopted for evaluation. Similarly, in the event of discrepancy between words and quoted figure, words will prevail.

3.0 To ascertain the inter-se-ranking, the comparison of the responsive bids will be made on the basis of total amount quoted for the items detailed in Schedule of rates, Units and Quantity.

4.0 Purchase Preference, if any will be as per Section B of "General Terms & Conditions" for e- Procurement as per Booklet No. MM/CALCUTTA/E-01/2016 (LCB Tenders).

5.0 In case 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 the Tender and/or elsewhere, those mentioned in this BEC / BRC shall prevail.

ANNEXURE-B

CERTIFICATE OF ANNUAL TURNOVER & NET WORTH

TO BE ISSUED BY PRACTISING **CHARTERED ACCOUNTANTS' FIRM** ON THEIR LETTER HEAD

TO WHOME IT MAY CONCERN

This is to certify that the following financial positions extracted from the audited financial statements of **M/s.....**(Name of the Bidder)for the last three (3) completed accounting years upto.....(as the case may be) are correct.

YEAR	**TURN OVER** In INR (Rs)	**NET WORTH** In INR (Rs)

Place:

Date:

Seal:

Membership No..

Registration Code:

Signature:

---------xxxx---------

REVISED ANNEXURE-I to tender no. SKI 3432P17/03 dtd 26.12.16

SPECIFICATION OF SILENT DIESEL ENGINE DRIVEN GENERATOR SET OF CAPACITY RANGE 330kVA - 400 kVA

1.0 SCOPE OF SUPPLY

1.1 One number new diesel engine driven generator set of rating in the range 330kVA (264kWe) to 400kVA (320kWe), 415V, 50Hz, 0.8PF (lag) for Emergency Standby Duty (ESP) complete with all standard accessories control panel, safety devices, generator breaker etc.

1.2 Microprocessor/ Relay based AMF control panel for automatic start of the DG set.

1.3 Installation and commissioning of the DG set including reliability run/trial run at Oil India Limited, Moran – 785669, Assam.

2.0 OPERATIONAL REQUIREMENT

2.1 The DG Set shall be standby source of power in the event of normal power supply failure in Moran Power Station of Oil India Limited (2 X 3MW Gas Turbine based captive power plant).

2.2 Purpose of the DG Set is to supply electrical power:

(a) For starting of 3MW Gas Turbine Generator (GTG) Unit. Electrical load in gas turbine starting system includes one VFD driven 100KW induction Motor as highest load.

(b) To all emergency/critical electrical loads (approx. 70 KW) of captive power plant In the event of normal power supply failure.

2.3 DG set shall be capable to take starting load of 100 KW induction motor (VFD driven, starting current around 280A) when already loaded with the base load of about 70KW.

2.4 Automatic Start (Automatic Main Failure Scheme): The Diesel Generator Sets shall be suitable for manual start and auto start. In manual start the Diesel Generator shall be started manually by an operator. In auto start the Diesel Generator shall start on receiving an impulse from under voltage relay in the event of normal power supply failure.

2.5 Starting system of the DG set shall be electrical starting system complete with batteries, battery charger, DC starting motors, starting relay etc. Battery Charger with

float and boost charging facility shall be independent of engine running. Power supply to the charger shall be from normal station power supply, not linked to the DG set.

3.0 GENERAL REQUIREMENTS FOR THE GENERATOR SETS

3.1 The generator set shall be sturdy, rugged, proven and extremely reliable and durable. The generator set shall be suitable for operation in single island mode operation (round the clock on rotation).

3.2 The generator set shall be resistant to dirt in the air, tolerant of extremes of temperature.

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

3.4 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.

3.5 Vendor shall furnish all relevant data of complete package as per Annexure - IV (Data Sheet).

4.0 CODES & STANDARDS

4.1 All equipment in the offer shall conform to the following, but not limited to them, latest edition of relevant codes & standards.

4.2 ISO 3046/1 or equivalent Indian Standard: Specification for reciprocating internal combustion engines

4.3 ISO 8528 or equivalent Indian Standard: Rotating electrical machine

4.4 IS: 10000(Part-iv) (or) (ISO: 3046) (Latest edition): Declaration of power, efficiency, fuel (Diesel) and lube oil consumption for diesel engine.

4.5 IS: 10002: Specification for performance requirement for constant Speed Engines (above 20 KW).

4.6 IS: 12065 Noise limit

4.7 IS: 13364 Specification of Alternator coupled with IC Engines

4.8 IS: 12075 Vibration

4.9 IS: 4691 Enclosure Protection

4.10 IS: 6362 Cooling

4.11 IS: 2253 Mounting

4.12 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.

5.0 SITE CONDITIONS

5.1 The ambient condition of the generator sets shall be:

5.2 Maximum Ambient Temperature : 40°C

5.3 Minimum Ambient Temperature : 03°C

5.4 Maximum Humidity at 21°C : 100 %

5.5 Maximum Humidity at 35°C : 95 %

5.6 Maximum Humidity at 41°C : 70 %

5.7 Maximum Altitude above sea level: 150 Meter

6.0 COMPOSITION OF DIESEL FUEL.

High Speed Diesel as per IS 1460: 2005.

7.0 TECHNICAL SPECIFICATION

7.1 STATUTORY NORMS

7.1.1 Engine:

The emission limit of the Diesel engine of the generating set must comply with the latest CPCBII norms or as notified by Govt of India as per G.S.R. 771(E). –sections 6 and 25 of the Environment (Protection) Act,

(i) 1986 (29 of 1986), the Central Government (Govt of India) and subsequent notifications as applicable.

Note-The latest version of the emission norm as applicable, shall be valid for evaluation purpose.

(ii) The offered Engine of the DG set should have valid Conformity of Production Verification for Emission Compliance from Certification Agencies as per latest CPCBII notification. A copy of the same has to be furnished along with the offer.

Note-The latest version of the emission norm as applicable,shall be valid for evaluation purpose.

7.1.2 Acoustic Enclosure (Canopy) :

(i) The offered DG sets should be enclosed in Acoustic Enclosure mounted on to common base frame with provision of easy portability of the whole generating set. The maximum permissible sound pressure level for the diesel generator (DG) sets with must be 75 dB(A) at 1 meter away from the enclosure surface and must conform to the latest CPCB norms.[As notified by Environment (Protection) second Amendment Rules vide GSR 371(E), dated 17th May 2002 at serial no.94 and its amendments vide GSR No 520(E) dated 1st July 2003; GSR 448(E), dated 12th July 2004; GSR 315(E) dated 16th May 2005; GSR 464(E) dated 7th August 2006; GSR 566(E) dated 29th August 2007 and GSR 752(E) dated 24th October 2008; G.S.R. 215 (E), dated 15th March, 2011 under the Environment (Protection) Act, 1986)]

(ii) The offered DG set should have valid Type Approval / Conformity of Production Certificate from Certification Agencies as per latest CPCBII notification for Noise Limit. A copy of the same has to be furnished along with the offer.

7.1.3 The bidder must confirm the following in their bid, failing which their bid shall be rejected:

(i) In the event of any new CPCB norms/regulations governing Diesel Engine driven Generating set are made effective prior to delivery of the Set (but after bid closing date) the supplied DG set shall comply with the latest CPCB norms/regulations.

(ii) The compliance report from Govt. approved agencies, if any, must be submitted prior to dispatch of the pump set for OIL's scrutiny and acceptance.

7.2 DIESEL ENGINE AND GENERATOR SET RATING/CAPACITY:

a) The engine-generator set, as a unit, shall be rated for a Emergency Standby Power application in the range of Range **330kVA (264kWe) - 400kVA (320kWe),** at 0.8-PF (lag) with an output of minimum **425 amperes** while generating 415 Volt AC, 3-phase, 50 Hz power.

b) Generator set should be ready to use type and suitable to operate on the given High Speed Diesel as per IS 1460: 2005.

c) 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 limits.

d) The generator drive-engine shall be a four-stroke, compression-ignited, with heat exchanger / radiator cooling system, turbocharged after cooled, diesel engine capable of meeting the rated output and duty of the generator set with 1500RPM as speed, compression ratio not exceeding 18.0:1. It should also be capable to operate without any external ventilation system.

e) The generator drive-engine shall be robust, durable with proven track record. It should be known for high reliability and durability.

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 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.

c) Engine BHP with Speed Diesel as per IS 1460: 2005 as engine fuel and at 1500RPM and 18:1 Compression Ratio or lower.

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

e) 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.

7.3 ALTERNATOR AND CONTROL PANEL and other electrical items:

(Refer Annexure II for Specification of Electrical Items)

8.0 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 diesel engine driven generating set as per standard practice with the specified technical requirements suitable for Emergency Standby Power (ESP) Operation.

8.1 DIESEL 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 – As per Point no. (D) of Annexure II for Specification of Electrical Items.

(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 - 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.

(v) FUEL SYSTEM - fuel system shall comprise of isolation valve, diesel filter, diesel tank besides other accessories etc. The capacity of the diesel tank should be such so as to run the engine for a min period of 24 hours without refill.

(vi) GOVERNOR STANDARDS –

(a) Engine: IS:10001/BS:5514

(b) Governing: Class A-1 specifications of IS: 10000 / BS: 5514.

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.

(vii) 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.

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.

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

(ix) 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

(x) 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

Engine control section: This section shall have:

Digital RPM meter -1 No.

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 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-annunciation 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.

8.2 ALTERNATOR AND CONTROL PANELS AND OTHER ELECTRICAL ITEMS.

i) Refer Annexure II for specification of electrical items.

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

9.0 ACOUSTIC ENCLOSURE

(Refer Annexure III for specification of Acoustic enclosure & Enclosure Illumination.)

10.0 SKID

Engine and Alternator shall be directly coupled or coupled by means of flex plate/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.

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 Annexure IV for details of data sought)

(ii) NAME PLATE

The following data shall be engraved on the name plate:

(iii) Diesel 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:

Spares for two years normal operation in addition to the normal commissioning spares of the generating set should be included in the offer. Item wise breakdown price of spares should also be provided but that will not be considered for price evaluation.

The following items shall have to be offered as MANDATORY SPARES and to be supplied alongwith the complete package (The cost of the same to be included & indicated separately in the main offer):

(a) Engine Spares:

i. Fuel filter - 06 nos (per genset)

ii. Lub. oil filter - 06 nos (per genset)

iii. Air filter- 06 nos (per genset)

iv. Complete Set of Belts – 04 Sets (per genset)

v. Coolant for each engine

(b) Electrical Spares

i. AVR Unit for Alternator- One no. per Gen Set
ii. Rotating rectifier assembly fitted with complete set of forward and reverse diodes- One set per Gen set
iii. ACB/MCCB complete with trip unit, coils etc as fitted inside generator control panel. This ACB/MCCB shall be tested by installation inside the control panel during commissioning of the set.

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 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

14.3 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.

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: Two with this order.

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) Warranty Certificate

15.0 INSPECTION AND TESTING

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

(For installation and commissioning of electrical items refer to Annexure II)

i) Installation and Commissioning of the generating set complete with control panel shall be carried out by the bidder in the presence of OIL representatives at **sites at Oil India Limited, Moran – 785669, Assam(India).**

ii) Installation / commissioning charges should be quoted separately which shall be considered for evaluation of the offers. These charges should included amongst others to and from fares, boarding/ lodging and other expenses of the service personnel during their stay at Moran, 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) 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.

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

vi) 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.

vii) Any special/ specific item required for commissioning job shall be provided by the bidder.

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 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, fuel 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, travel expense necessary for repairs at the jobsite, and expendables (lubricating oil, filters 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 GENERAL NOTES TO TECHNICAL SPECIFICATION

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

b) 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.

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

d) 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.

e) 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.

f) Bidder must confirm in the Technical Bid that the major equipment such as Diesel 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.

20.0 ANNEXURE II: SPECIFICATION OF ELECTRICAL ITEMS

(Refer tender Attachment for Annexure II)

21.0 ANNEXURE III: SPECIFICATION OF ACOUSTIC ENCLOSURE

(Refer tender Attachment for Annexure III)

22.0 ANNEXURE-IV EQUIPMENT DATA SHEET

(Refer tender Attachment for Annexure IV)

23.0 ANNEXURE-V TECHNICAL CHECK LIST (FOR BIDDER)

(Refer tender Attachment for Annexure V)

REVISED ANNEXURE-II to tender no. SKI 3432P17/03 dtd 26.12.16

20.0 ANNEXURE II: SPECIFICATION OF ELECTRICAL ITEMS

A. ALTERNATOR:

1. Make:
   KIRLOSKAR/NGEF/STAMFORD/CROMPTONGREAVES/CATERPILLAR/KATO /GENERAL ELECTRIC USA
2. Rated Output : Within 330kVA to 400kVA at 0.8 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: RYB - 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. Alternators Enclosure Protection : IP 23
13. Alternators Terminal Box Protection: IP 54
14. Excitation system: Brush less, self excited, self Regulated with solid state AVR. Voltage characteristics- VG3 as per Table-1, IS-13364 (Part-2)
15. 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.

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

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

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

22. Cooling: Air cooled by integral fan

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

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

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

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

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

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

29. 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.

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

31. 2 nos. of earth points are to be provided on both sides of the alternator.

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

33. 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.

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

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

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

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

a) IS: 12065 Noise limit

b) IS: 12075 Vibration

c) (iii) IS: 4691 Enclosure Protection

d) (iv) IS: 6362 Cooling

e) (v) IS: 2253 Mounting

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

B. Generator Control panel :

A separate control panel 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 panel should broadly have the following compartments/sections.

1. Generator Breaker: 800A 4 pole TPN MCCB or ACB, draw out type, breaking capacity minimum 50kA with adjustable OL protection from 0.4 X In. The Generator Breaker (MCCB or ACB) should have all standard protection features integrated into it, including short circuit, earth fault, overload etc. The Generator Breaker (MCCB or ACB) should trip on (a) Over load, short circuit and earth fault- Tripping from internal trip unit, (b) Over/under voltage & Over/under Frequency- From voltage and frequency relays, (c) Engine fault (Low lube oil, high water temp, over speed etc.)- Trip contact from engine protection system.

Incoming and outgoing power cables shall terminate on electrolytic grade, high conductivity electro-tinned copper links / spreader bars / bus bars liberally sized for termination of all power cables. Two nos. outgoing power cables of 3.5 X 240 sq.mm, 1100V grade, stranded, aluminium cable shall be used for termination at outgoing terminals of the breaker. Neutral bar shall also have provision for connection of lead for neutral earth.

2. Generator Protection Section: This section shall have protection features for the generator and the engine. The generator breaker should trip or alarm annunciated on the following faults: (a) Over load, short circuit and earth fault- Tripping from generator protection relay, (b) Low and high Engine Speed- Trip signal from engine protection system, (c) Over and under voltage- Trip signal from generator protection relay, (d) Generator winding, bearing over temperature- Trip signal from generator protection relay, (d) Engine fault (Low lube oil, high water temp, over speed)- Trip signal from engine protection system

Components of the protection system: (a) Built-in long time overload, short time fault, instantaneous short circuit, earth fault protections- in the MCCB / ACB, (b) 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 Schneider/ Sepam Series 40 of Merlin Gerin/ Siprotec Compact 7SJ80 of Siemens, (c) 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

3. Generator Control Section : This section shall have the followings :

3.1 Meters:

(i) 1 No. Three phase analog 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).

(ii) 1 No. Three phase analog ammeter with selector switch, Size- 96x 96mm sq. mm, 0-800 Amps, C.T. operated , Auxiliary power supply 230V AC, class of accuracy -0.5 (Make: AEI/ Conzerv/ L&T)

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

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

(v) 1 No. Multifunction meter (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).

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

CT - Bar Primary Resin Cast CT of 600/5 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.)

All meters shall be mounted in front of the panel.

3.2 Indications: Indications for the following are to be provided:

(i) Engine running

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

(iii) Trip circuit healthy

(iv) Electrical fault (From aux contact of trip unit of ACB / MCCB)

(v) Over/under voltage

(vi) Over/under frequency

(vii) Engine fault

(viii) Set on load

(ix) Over temp. for bearing and winding

(x) Battery charger ON

(xi) Any other indication as per OEM

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

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

3.3 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.

3.4 Auxiliary relays: 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.

C. AMF Panel:

Circuitry for AMF panel shall be integral part of Main Control & Protection Panel.

1. Auto mode: This shall be effective in Auto position of AUTO / MANUAL Selector switch located in Main control and protection panel. The diesel generator set will normally be at rest. Upon failure of plant normal power supply, an impulse will be extended. The impulse shall be normally from an under voltage relay. Upon receipt of this impulse, DG Set shall be started automatically and brought to rated speed and generator voltage brought to rated value. All accessories required for starting and completion of various sequences of operation for the above purpose shall be provided. In case the DG fails to start and run up on first attempt the engine cranking shall be repeated two more times. When engine does not respond to three impulses, it shall be locked out and alarm given. Immediately after the diesel set reaches rated speed and generator reaches rated voltage, a Voltage and frequency monitoring relay located in Main Control and protection panel shall extend an impulse for closing generator breaker.

2. Manual / Test Mode: In this mode of operation, the operator shall manually start the DG set. Facility for manually starting the diesel generator set for routine testing shall be provided. This shall be done by putting the AUTO / MANUAL Selector switch in Manual Position. Routine testing would be done putting selected load on the DG set.

3. Starting time: The total time from the receipt of starting impulse for diesel generator set till the diesel generator set reaches rated speed and rated voltage shall not be more than 10 seconds.

D. Starting System & Battery Charger:

Electrical starting system complete with batteries & battery charger shall be provided for the DG Set. The engine starting system shall include 24 volt DC starting motors, starting relay, automatic reset circuit breaker to protect against butt engagement etc.

1. Batteries shall be of 24 V lead acid battery (SMF) / bank of adequate ampere hour capacity (at 10 hours discharge rate for supplying control power to control panel and starting power to engine starting motor) complete with connecting leads first charging and routine check, instruments including hydrometer and cell tester, teak wood stand, floor insulators, cell supporting insulators, etc. It shall be possible to start the engine three times in immediate succession without appreciable drop in DC Voltage. The battery shall have a sufficient capacity to start the engine more than 4 times consecutively.

2. One suitable Battery Charger with float cum boost charging facility independent of engine running shall be provided. Since DG set will remain mostly in standby mode, power supply to the charger shall be from normal station power supply. Suitable changeover switch shall be provided for putting either of the battery set on charging.

E. 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.

F. ELECTRICAL SPARES

Following spares shall be supplied by the party along with the complete package for the Gen set 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. ACB/MCCB complete with trip unit, coils etc as fitted inside generator control panel. This ACB/MCCB shall be tested by installation inside the control panel during commissioning of the set.

G. 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

Intimation for inspection for each item must be sent to OIL at least 15 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, Moran only on receipt of OIL's dispatch advice.

H. COMMISSIONING OF ELECTRICAL PART OF THE UNIT

1. Installation and Commissioning of the generating sets, control panels, MCC shall be carried out by the supplier in the presence of OIL representatives at OIL Moran, 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) earthing jobs, supply of earthing cables (external earthing, as described in the "I: Earthing" clause), earthing 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.
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.

I. 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.

J. GUARANTEE

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

REVISED ANNEXURE- V to tender no. SKI 3432P17/03 dtd 26.12.16

24.0 TECHNICAL CHECK LIST (FOR BIDDER):

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 in the range 330kVA – 400 kVA at 0.8PF, 415Volts AC 3 Phase 50Hertz Emergency Standby 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 diesel 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 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.	YES/NO
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 certifying the rated output vis-a-vis compression ratio and RPM of the engine submitted with the technical bid?	YES/NO
23	Whether undertaking from the engine manufacturer in support of the engine rating and output is submitted?	YES/NO
24	Whether two sets of Composite Operation Manual for the Generator Set Complete and Trouble Shooting Chart shall be supplied along with the Order?	YES/NO
25	Engine Shop Manual (Engine Rebuilding Manual) and Parts Manual shall be supplied with the Order?	YES/NO
26	Whether spare parts of engine 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

27	Whether the content of this Check List is read and responded?	YES/NO

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