



INDRADHANUSH GAS GRID LIMITED
(Joint Venture of IOCL, ONGC, GAIL, OIL and NRL)
GUWAHATI, ASSAM

CORRIGENDUM 2

FOR

**UPS SYSTEM FOR PIPELINE SECTIONS
(1,2,3,4,5,6,7,8,9,12,13&14) UNDER NORTH EAST GAS GRID
PIPELINE PROJCT OF M/s IGGL**

OPEN DOMESTIC COMPETITIVE BIDDING

Tender no.: 05/51/23VC/IGGL/071

**Visit: www.tenderwizard.com/MECON
(Tenderwizard helpdesk: 011-49424365)**



PREPARED AND ISSUED BY
MECON LIMITED
(A Govt. of India Undertaking)
Delhi, India



CORRIGENDUM # 2
UPS SYSTEM FOR PIPELINE SECTIONS (1,2,3,4,5,6,7,8,9,12,13&14) UNDER NORTH EAST GAS GRID PIPELINE PROJCT OF M/s IGGL
Tender No. 05/51/23VC/IGGL/071



Date: 10.01.2022

Sl. No.	Description	Volume	Page No.	Clause / Para / Section	Amendment / Addition / Modification / Deletion
1	AVAILABILITY OF TENDER DOCUMENT ON WEBSITE(S)	I of IV	5 of 280	2.0 (G) of IFB	Amendment The clause no. 2.0 (G) of IFB, shall be read as AVAILABILITY OF TENDER DOCUMENT ON WEBSITE(S) :From 16.12.2021 to 20.01.2022 (1400 Hrs, IST) on following websites: (i) Tender Wizard's e-Procurement Portal (e-Portal): www.tenderwizard.com/MECON Contact person:- Mr. Suraj Singh Mobile:- 9599653865/01149424365 (The same may also be referred as IGGL's E-Portal in this tender document) (ii) IGGL Website – https://iggl.co.in/ (iii) Govt. CPP Portal - https://etenders.gov.in (iv) MECON's Tender Website:- www.meconlimited.co.in
2	DUE DATE & TIME OF BID-SUBMISSION (ON OR BEFORE)	I of IV	6 of 280	2.0 (I) of IFB	Amendment The clause no. 2.0 (I) of IFB , shall be read as DUE DATE & TIME OF BID-SUBMISSION (ON OR BEFORE) : Upto 1400 hrs. (IST) on 20.01.2022
3	DATE AND TIME OF UN-PRICED BID OPENING	I of IV	6 of 280	2.0 (J) of IFB	Amendment The clause no. 2.0 (J) of IFB , shall be read as DATE AND TIME OF UN-PRICED BID OPENING At 1500 hrs. (IST) on 20.01.2022 Shall be conducted through Video Conferencing Details of VC as under Google Meet joining info Video call link: https://meet.google.com/ceb-nchy-jvh
4	Cut Out Slip	I of IV	8 of 280	-	Amendment The revised cut out slip is enclosed as Annexure-I to this Corrigendum.
5	Scope of Work Doc No. MEC/23UU/05/E9/E/UPS/00 1	Vol-II of II			Modification Revised scope of work with CAMC scope of work is attached as Annexure-II to this Corrigendum.
6	Data sheet for UPS system Doc No.MEC/DS/05/E9/071	Vol-II of II			Modification Revised data sheet of UPS attached as Annexure-III to this Corrigendum.

All other terms & conditions of tender document remain unaltered.

ANNEXURE-I to CORRIGENDUM 2

DO NOT OPEN - THIS IS A QUOTATION

Tender Document No. : 05/51/23VC/IGGL/071

Description : UPS SYSTEM FOR PIPELINE SECTIONS
(1,2,3,4,5,6,7,8,9,12,13&14) UNDER NORTH EAST
GAS GRID PIPELINE PROJCT OF M/s IGGL.

Due Date& Time : 20.01.2022 at 1400 Hrs (IST)

From: ***To:***

	<p><i>The Sr. General Manager (Contracts)</i> <i>MECON LIMITED</i> <i>15TH FLOOR, NORTH TOWER,</i> <i>SCOPE MINAR,</i> <i>LAXMI NAGAR,</i> <i>DELHI – 110092</i> <i>Ph No.: 91-11-22401112/22401143</i> <i>Fax No.: 91-11-22041214</i> <i>Email : cont-delhi@mecon.co.in</i></p>
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(To be pasted on the envelope containing Physical documents)

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ANNECURE-II to CORRIGENDUM 2



INDRADHANUSH GAS GRID LIMITED

SCOPE OF WORK

UPS SYSTEM FOR NORTH EAST GAS GRID PIPELINE PROJECT

Section 1,2,3,4,5,6,7,8,9,12,13&14

(ELECTRICAL SECTION)




MECON LIMITED DELHI

Document No.	Revision No.	Date
MEC/23UU/05/E9/E/UPS/001	1	08.01.2022

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ANNEXURE-I : Vendor Data Requirement (Electrical)

ANNEXURE-II : SCADA COMMUNICATION AND MAPPING DETAILS

Rev. No.	Date	Prepared By	Checked By	Approved By
0	06.12.2021	A.Moyal, Sr.Manager	M.K.Jaiswara, Sr.Manager	A.Bhowmic, GM(Elect)
1	08.01.2022	A.Moyal, Sr.Manager	M.K.Jaiswara, Sr.Manager	A.Bhowmic, Sr GM(Elect)

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1.0 GENERAL

1.1 Introduction

M/s Indradhanush Gas Grid Limited (IGGL), a Joint Venture of IOCL, ONGC, IGGL, OIL and NRL, is in the process of implementing the North East Gas Grid (NEGG) with a vision to connect all the eight (08) north eastern state capitals and major consumption centers in the region. The NEGG will be connected to National gas grid at Guwahati through Barauni-Guwahati pipeline (already under execution by M/s IGGL).


M/s IGGL has awarded M/s MECON Limited Project Management Consultancy (PMC) services for North-East Gas Grid pipeline Project. The following pipelines are to be considered for the UPS system supply under this package –

- Section- 1** Laying and terminal works from **DT at Ch. 0.00** (including pipeline from TOP on BGPL line to DT) **to IP-1 at Ch. 97.5 Km** including associated works at four (04) SV stations, one (01) IP station & one (01) Dispatch Terminal.
Laying and terminal works from **IP-1 at Ch. 97.5 Km to IP-2 at Ch 191.1 Km** including associated works at four (04) SV stations & two (02) IP stations excluding terminal works at IP-1.
- Section- 2**

Laying and terminal works from **IP-2 at Ch. 191.1 Km to IP-3 at Ch. 296.639 Km** including associated works at five (05) SV stations & two (02) IP stations excluding terminal works at IP-2.

Laying and terminal works from **SV-10 cum DT at Barphalong Gaon at Ch.0.00 Km to RT-Itanagar at Ch. 26.994 Km** including associated works at one (01) SV Station, one (01) DT, one (01) RT at Itanagar.

Laying and terminal works from **IP-3 at Ch. 296.639 Km to RT Numaligarh at Ch. 386.264 Km** including associated works at three (03) SV stations, one (01) IP Station and one (01) RT at Numaligarh excluding terminal works at IP-3.
- Section-3** (18" NB x 112.175 Km (approx.) mainline from Silchar (IP-2) to Receiving Terminal at Panisagar including SV Station-8 to SV Station-12 and injection point for Adamtila gas field)
- Section-4** (12" NB x 56.310 Km (approx.)) Banaskhandi Feeder Line cum Silchar CGD & other feeder lines including DT at existing SV-08 (Silchar (IP-2)- Panisagar P/L), SV Station-01(SIL), SV Station-02(SIL), Tap-off point for Hindustan Paper, Injection point for Banaskhandi Feeder Line and RT at Silchar.

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5. **Section-5** (12" NB x 117.886 Km. (approx.) mainline from DT at Panisagar to Receiving Terminal at Agartala including SV-01(AG) to SV-06(AG) and injection point for Kubal gas field)
6. **Section-6** (18" NB x 195.7 Km. (approx.)) Mainline from DT at existing RT Guwahati (BGPL) to Silchar (IP-2) including SV-01 to SV-07, Tap-off Point for Amit Cement & Adhunik Cement and, IP-01.
7. **Section-7** (12" x 126.712 Km (approx.)) Mainline from DT at existing RT at Panisagar to RT Aizawl including SV-01(AZ) to SV-06(AZ).
8. **Section-8** (12" x 128.311 Km (approx.)) pipeline from DT at existing SV-15 (GNPL), Dergaon to RT Dimapur including SV-01(D) to SV-07(D), injection points for ONGC KSAB WHI, ONGC SUAA WHI & ONGC Khoragaht Feeder Line.
9. **Section-9** (12" x 3.596 Km (approx.) spurline from Injection point to dispatch facilities at Khubal gas field) for transportation of Natural Gas (dry)/ R-LNG.
10. **Section-12** (12" x 85.836 Km (approx.) feeder line to Agartala to Tulumura for transportation of Natural Gas (dry)/ R-LNG.
11. **Section-13** (12" x 6.283 Km (approx.)) spurline from Dispatch facilities at existing RT at Agartala to Receiving facilities at NEEPCO.
12. **Section-14** (8" x 22.135 Km (approx.)) Shillong CGD Spurline from DT at IP-01 (Guwahati-Silchar (IP-2) P/L) to RT Shillong including SV-01(SH).

The intent of this specification is to define the requirements for the supply, erection, testing and commissioning of the UPS, Rectifier, ACDB, DCDB, battery bank, interconnecting cables etc as per SOR. The work shall be carried out in the best workmanship – like manner, in conformity with these specifications, approved drawings and the instructions of the Engineer-in-charge from time to time.

In case of any conflict between the codes and standards listed, the same shall be brought to the notice of Owner/Consultant for final decision, which shall be binding.

1.2 Standards

The work shall be performed in conformity with, standard specifications and installation standards enclosed and code of practices of the Bureau of India Standards. In case of any conflict, the stipulations under this specification shall govern.

In addition, the work shall also conform to the requirements of the following:

The Indian Electricity Act, and the rules framed there under


The fire Insurance Regulations

The regulations laid down by the Chief Electrical Inspector of the state government / Central Electricity Authority (CEA).

The regulations laid down by the Factory Inspector.

The regulations laid down by the Chief Inspector of Explosives.

Any other regulations laid down by the Central, State or Local Authorities from time to time

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during the pendency of this contract.

M.B.Lal Committee recommendations for electrical design & installation.

1.3 Guarantee

The Bidder shall guarantee the installation against any defects of workmanship and materials (supplied by the Bidder) for a period of 12 months from the date of commissioning. Any damage or defects connected with the erection of materials, equipments or fittings supplied by the Bidder that may be undiscovered at the time of issue of the completion certificate, or may arise or come to light thereafter, shall be rectified or replaced by the Bidder at his own expense as deemed necessary and as per the instruction of the Engineer-in-charge within the time limit specified by the Engineer-in-charge.

The above guarantee shall be applicable for the quality of work executed as well as for the equipment / cable / fittings/ other material supplied by the Bidder.

1.4 Site Conditions

The equipment offered and the installation shall be suitable for continuous operation under the following site conditions.

Ambient temperature	:	50°C/ 2°C (max.)
Max relative humidity	:	95%
Altitude	:	less than 1000 m
Atmosphere	:	To withstand site condition (Dry during summer, Humid & Heavy rainfall during monsoon & low temp during winter)


1.5 Power Supply Parameters :

i) For DT,RT & IP STATIONS station:

NORMAL POWER	415V AC, 3 Phase & Neutral
LIGHTING DISTRIBUTION (Normal)	230 V AC, 1 Phase
CRITICAL LIGHTING	230 V AC, 1 Phase BY INVERTER
INSTRUMENTATION (UPS)	230 V AC, 1 Phase 24 V DC
TELECOM SYSTEM (UPS)	230 V AC, 1 Phase -48 V DC
SCADA (UPS)	230 V AC, 1 Phase 24 V DC
CP SYSTEM (UPS)	230 V AC, 1 Phase
FA & CO2 FLOODING SYSTEM (UPS)	230 V AC, 1 Phase
FEP/CCTV/SDH/EPABX/PIDS Server	230 V AC, 1 Phase

2.0 SCOPE


The Bidder's scope of work includes UPS system, Rectifier, Battery Bank, ACDB / DCDB & interconnecting cables as per SOR at following terminals:

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STATION WISE UPS SYSTEM LOCATION

S. No.	TERMINAL DESCRIPTION	Pipeline Chainage	UPS Rating	Part
Assam state (DT SV-32 to Numaligarh Pipeline)				
1	DT SV 32	Refer Schematic Diagram attached with tender document	25 kVA	Section- I (Part A,B,C &D)
2	SV-10 Cum DT for Itanagar P/L		5 kVA	
3	IP-1		5 kVA	
4	IP-2		5 kVA	
5	IP-3		5 kVA	
6	SV-15 CUM D/T For Dimapur		5 kVA	
7	R/T Numaligarh		25 kVA	
DT at Guwatahi to Panigasar P/L				
8	R/T cum D/T at Guwahati	Refer Schematic	10 kVA	Section-6
Arunachal Pradesh				
9	R/T ITANAGAR	Refer Schematic	10 kVA	Section- II (Part A,B,C &D)
Meghalaya State				
10	IP -1 Cum DT for Shillong	Refer Schematic	5 kVA	Section-6
11	R/T Shillong	Refer Schematic	10 kVA	Section-14
Assam State (DT at Guwatahi to Panigasar)				
12	IP-2	Refer Schematic Diagram attached with tender document	5 kVA	Section-3
13	SV-08 CUM D/T For Silchar CGD P/L with PIDS		25 kVA	Section-3
14	R/T Silchar		5 kVA	Section-4
15	SV-4 (D) Cum Injection Point		5 KVA	Section-8
Tripura State				
16	RT CUM DT at Panisagar	Refer Schematic Diagram attached with tender document	10 kVA	Section-3
17	RT Agartala		10 kVA	Section-5
18	R/T Neepco		5 KVA	Section-13
19	DT Tulumura		5 KVA	Section-12
Mizzoram State				
20	RT Aizawl	Refer Schematic	5 kVA	Section-7
Nagaland State				
21	R/T Dimapur	Refer Schematic	5 kVA	Section-8

Note: Rating and locations of the UPS may change during the detail engineering, Bidder shall provide the changed UPS system accordingly without any cost & time implications.

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2.1 SCOPE OF DESIGN & ENGINEERING

- 2.1.1 Submission of UPS System design calculations (Charger sizing, battery sizing), datasheets & GA drawings, detail engineering, various drawings/layouts for review and approval, BOM, preparation of site engineering drawings, procedures, PG test procedures and details for installation works wherever applicable or required by the Engineer-in-charge, and submits to the Engineer-in-charge for review.
- 2.1.2 Correction, updating and submission of all Owner's drawings for as-built status.

2.2 SCOPE OF SUPPLY


Design, Detailed Engineering, Manufacturing, Inspection/FAT (Factory acceptance test), Supply, Transportation, loading/unloading, insurance, storage at designated store hired by the Bidder in Various states as mentioned above, of complete UPS system alongwith battery set mentioned below & as per tender specification, data sheet enclosed including commissioning spares as required at terminals :

- 2.2.1 Supply of 5 KVA, 10 KVA & 25 KVA industrial UPS system, Rectifier, Battery Bank, Convertors, ACDB / DCDB & interconnecting cables as per SOR are in Bidder's scope of work. However, Incoming cables for UPS & all outgoing cables and cabling work from various DCDBs are not in Bidder's scope of work, the same shall be done by other Bidder through separate tender.
- 2.2.2 Fabrication and supply of MS frames, supports, canopies and brackets for miscellaneous electrical equipments in Bidder's scope, including welding, supply of bolts, nuts etc for mounting and other necessary supplies, all inclusive of painting as specified.
- 2.2.3 Confirmation on availability of spares for a period of 15 years along with Bid.
- 2.2.4 Supply of UPS system as per SOR at designated stores hired by the Bidder.
- 2.2.5 Supply of Two years O&M spares for UPS systems as per datasheet.

Price of 2 years O&M spares (as mentioned in Annex-IV of UPS datasheet) are inclusive of prices quoted by the Bidder in the bid for the UPS system.

Unit Price schedule for 2years O&M spares in SOR is for Addition/Deletion purpose only.

- 2.2.6 All commissioning & start up spares are in bidder's scope (Included in this package). Any commissioning & startup spare consumed during the startup & commissioning, is included in the supply of this package, for which no extra payment is made.
- 2.2.7 Bidder to note that all interconnecting cabling among UPS, Charger, Rectifiers, Converters & DCDBs (including supply & laying) & other electrics for the UPS System shall be supplied along with the package and no separate payment shall be admissible for the same.
- 2.2.8 Bidder to note that the exact cable routing shall be decided at site based on actual site conditions. Exact cable quantities/sizes shall be based on actual measured route lengths at site by Bidder in coordination with Engineer-in-Charge/Client. Bidder shall ensure that there is no surplus or shortage of cables at site and procure cables accordingly.

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2.2.9 CO-ORDINATION WITH OTHER BIDDERS

The UPS Bidder shall be entirely responsible for Co-ordination with respective Terminal Bidders & it should be ensured that all works related to UPS systems should be timely executed.

If the Bidder fails to timely execution of the UPS work as per tender, necessary penalty clause shall be applied as per the direction of the Engineer-in-Charge.


2.3 SCOPE OF INSTALLATION, TESTING & COMMISSIONING

Loading/unloading, transportation from designated store (Hired by Bidder) to site, fabrication, assembly, all mechanical works for installation, erection, commissioning and performance test at site of complete UPS system along with battery sets as mentioned below & as per tender specification, data sheet, PJS enclosed including commissioning spares as required at terminals. The scope also includes submission of first trial/commissioning reports of each location, submission of engineering drawings & documents for approval from IGGL / MECON for UPS System Installation, all other work not indicated here but required for completion of installation & commissioning as per the scope of work in the scope of bidder. Work shall be carried out as per relevant international & national standard, scope of work & specifications, approved drawings & documents.

- 2.3.1 Installation, testing & commissioning of 5KVA, 10KVA & 25 KVA UPS systems at the specified location is in the scope of the Bidder, Rectifier, Battery Bank, ACDB / DCDB & interconnecting cables as per SOR are in Bidder's scope of work.
- 2.3.2 UPS & Battery commissioning includes capacity test at site including arrangement of all required equipments in the scope of the Bidder i.e. DG set, Load bank wires and cables etc.
- 2.3.3 If any item/s damages during the above activities, it is responsibility of the Bidder to replace the same without any time and cost implication to the Owner.

3.0 OTHER MISCELLANEOUS WORKS

- 3.1 The job includes repairing of all civil cabin panels works damaged during installation of electrical facilities.
- 3.2 The scope of work under this contract shall be inclusive of breaking of walls, floors and chipping of concrete foundations, (if required) necessary for the installation of equipment, materials, and making good of the same.
- 3.3 Preparation of buried cable trenches, including, back filling, compacting providing of brick protection by second-class bricks, spreading of fine river sand, including all supplies, if any.
- 3.4 Minor modifications wherever required to be done in the owner free supplied equipments / devices to enable cable entry, termination, etc.
- 3.5 All electrical equipments are to be doubly earthed by connecting two earth wires from the frame of the equipment to be earth grid. The cable armours will be earthed thro' cable glands.

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The following shall be earthed:

- All non-current carrying metallic parts of electrical equipments such as lighting and power panels, push button stations, cable trays etc.

3.6 Sealing of opening made in the walls / floors for cables trays, cables, bus ducts, etc using acceptable practice and standards.

3.7 Test certificates, catalogues, vendor drawings, installation, operation and maintenance manuals for all equipment/materials in Bidder's scope of supply.

3.8 Supply and installation of all other accessories not specifically mentioned herein, but never the less necessary for completion of the job.

4.0 AREA CLASSIFICATION

Hydrocarbon handling areas have been generally classified as zone 1 & 2, gas group IIA/IIB as per IS: 5572, API RP-500, OISD - 113 and IP Rules. All equipments to be installed in these areas shall be suitable for the area classification with temperature class T3 (200 deg C), CMRI testing and approved by CCOE, DGFAS and having BIS license.

5.0 JOB SPECIFICATIONS

Various electrical works covered under this contract like equipment erection, cabling and grounding works, etc. shall be performed in accordance with specifications attached with this tender & relevant Indian standards. (Certain clauses of specifications, which are applicable to equipments or system not covered under this contract, shall not be applicable).

Erection and commissioning of certain special equipments shall be performed in accordance with instructions and directions of the Engineer-in-charge at site under supervision by equipment supplier/s.

The equipments/materials to be supplied by the Bidder shall conform to the requirements of the applicable specifications enclosed in the tender document.

6.0 STATUTORY APPROVAL OF WORKS

All works relating to statutory approvals of the complete installation of equipments / material supplied by Bidder, from competent authority like CEA, DGMS, State electricity authority/Board etc, shall be in the scope of Bidder, if any.


7.0 MAKES OF EQUIPMENTS AND MATERIALS

All equipments / materials supplied by the Bidder shall be as per the list of approved makes enclosed with this document subject to submission of Certification and approvals.

8.0 WORK CONTRACT

The entire work as per Scope of Work covered under this contract shall be treated as "Works Contract".

All works included in the scope of bidder will be done simultaneously with various terminals

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construction by Terminal Bidder. Bidder will supply all the materials required for completing the system and organise manpower & equipments accordingly to meet the requirement of UPS system work in all respect in time as per completion schedule given in Volume - I.

9.0 QUALITY ASSURANCE, INSPECTION & TESTING AT MANUFACTURER'S WORK

- a. All the equipment supplied and installed by the Bidder shall be inspected by the Owner/MECON and/or their approved inspection agency (TPI) at the manufacturer's works prior to dispatch. The equipment will be inspected as per the tests pre-identified in the approved QAP to ensure conformity of the same with relevant approved drawings, data sheets, specifications, National/International standards. The TPI shall be arranged by the Bidder for the testing of the material/equipments at the vendor works.
- b. Performance tests of any equipments which cannot be conducted/demonstrated either partially or wholly at the manufacturer's work, shall be conducted after erection at site in the presence of Owner & their inspection agency. In all the cases, prior approval of the approval shall be obtained.
- c. In case of waiver category of items, the same shall be pre identified. For such items, the Bidder shall furnish necessary certificates, test reports etc for Review/Approval to Owner/Inspection agency. The issue of Inspection Certificate/Waiver Certificate for any equipment or component thereof does absolve the Bidder from his contractual obligations towards subsequent satisfactory performance of the equipment at site. Should any equipment be found defective, In whole or part thereof after receipt at site or during erection/commissioning and testing shall be Rectified/Changed by Bidder free of cost.
- d. Bidder shall submit test plan for the equipments with four week advance notice.

10.0 TESTING & COMMISSIONING AT SITE

- a. All the equipment supplied and installed by the Bidder shall be tested and commissioned as required and no separate payments shall be made for the same. Any damage or defect noticed shall be brought to the notice of the engineer- in-charge and will be rectified without any delay and no payments shall be made for rectification.
- b. Any work not conforming to the execution drawings, specifications or codes shall be rejected forthwith and the Bidder shall carry out the rectification at his own cost.
- c. The Bidder shall carry out all the tests as enumerated in the technical specifications and as per applicable codes and standards.
- d. Before the electrical system is made live, the electrical bidder shall carry out suitable tests to establish to the satisfaction of engineer-in-charge that the installation of equipments, wiring and connections have been correctly done and are in good working condition and that it will operate as intended.
- e. All the tests shall be conducted in the presence of Owner/ Engineer-in-charge or his authorized representative unless he waives this requirement in writing. The Bidder shall arrange all testing equipment necessary to carry out the test. The tests shall be recorded on approved Performa and certified records of the tests shall be submitted to Owner/ Engineer-in-charge.

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- f. After the completion of all tests and rectification of all defects pointed out during final inspection, plant start-up trials would be commenced. During the start-up trials Bidder shall provide skilled / unskilled personnel and supervision round the clock at his cost. The number and category of workmen and duration up to which required, will be decided by the Engineer-in-charge. Any defects noticed during the start-up trial relating to the equipment supplied and work carried out by the Bidder, will be rectified by the Bidder at his own cost.
- g. Engineer-in-charge shall have the right to get these defects rectified at the risk and cost of the Bidder if he fails to attend to these defects immediately as desired.
- h. After the operating conditions are fully achieved in the plant and the other requirements as stated in the General Conditions of Contract are fulfilled, the Bidder would be eligible for applying for a completion certificate.

11.0 DOCUMENTATION

11.1 Drawings and design documents

11.1.1 The following documents shall be submitted along with the offer:

- a) Filled up data sheets & Check lists
- b) HSE Policy
- c) QAP
- d) Bar Charts & Project completion schedule
- e) Un-priced List of two years operation and maintenance spare

11.1.2 The following drawings (in three sets) & documents shall be submitted for approval within 3 weeks of award of contract.


- a) Equipment detailed design & sizing calculations along with formulae used
- b) Battery Sizing calculations
- c) Various Installation & PG Procedures
- d) Equipment GA drawings & datasheet.
- e) Equipment installation & erection details drawings.
- f) Tentative Bill of Material.
- g) Vendor Data requirement as per Annexure-I.
- h) Quality Assurance Plan of equipments.

11.1.3 After the job completion, Bidder shall prepare AS-BUILT drawings/data sheets and documents, submit catalogues/manuals (O&M) of major brought out items. Final certified as built drawings, documents and manuals etc shall be submitted by the Bidder to owner in bound volume with one set in soft copy (CD) plus two sets of prints to owner & one set to MECON..

Other drawings and documents shall be submitted by Bidder along with AS-BUILT Drawings/Datasheets-

- a) Test documents & drawings for bought out items.
- b) Detailed commissioning report of UPS system.

12.0 ESCALATION

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The Rates quoted shall be kept firm till completion of work and no price Escalation shall be paid.

13.0 DRAWINGS, STANDARD SPECIFICATIONS AND INSTALLATION STANDARDS

- 13.1 The equipments / materials to be supplied by the Bidder shall conform to the requirements of the applicable specifications. Also the installation of various material / equipment shall conform to the installation standards /norms.
- 13.2 The drawings accompanying the tender documents when read with specification shall depict the electrical system of the Terminal. These are indicative of the nature of work and issued for tendering purposes only. Purpose of these drawings is to enable the tendered to make an offer in line with the requirements of the Owner. Construction shall be as per drawings / specifications issued / approved by the Engineer-in-charge during the course of execution of work.
- 13.3 After the job completion, Bidder shall prepare AS-BUILT drawings and documents, submit catalogues/manuals (O&M) of UPS system.

Final certified as built drawings, documents and manuals etc shall be submitted by the Bidder to owner in bound volume with one set in soft copy (CD) plus two sets of prints.

List of Standard Specification/Datasheet/QAP/Block diagrams/Schematic Route diagram

A) SPECIFICATION

- | | | |
|----|---------------------------------|--------------------------|
| 1. | Specification for UPS system | MEC/TS/05/E9/071 |
| 2. | Specification for Ni-Cd Battery | MEC/TS/05/E9/071C |

B) DATA SHEETS & QAP


- | | | |
|----|--------------------------|-----------------------------------|
| 1. | Quality Assurance Plan | MEC/05/E9/23VA/QAP/UPS/001 |
| 2. | Datasheet for UPS system | MEC/DS/05/E9/071 |

C) STANDARD DRAWINGS

- | | | |
|----|--|------------------------------|
| 1. | Block Diagram for UPS system,
Rectifier & ACDB/DCDB | MEC/SD/05/E9/E/071/01 |
|----|--|------------------------------|

14.0 DOCUMENTS TO BE SUBMITTED/ PRODUCED ALONGWITH R.A. BILLS


- Computerized R.A. Bill/ Manual Bill, with IT No./ ST No./ Labour License No. printed thereon.
- ESI/ EPF clearance certificates for the last month alongwith R.A. Bills.
- Insurance Policy as per relevant clauses of Contract Agreement.
- Attendance Register and Salary Records.
- Photocopy of the measurement book to be attached with R.A. Bills.
- Any other document required for the purpose of processing the bills.
- Registration Certificate with Sales tax authorities of state concerned.

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Annexure-I


Vendor Data Requirement (Electrical)

	Documents	With bid	For Review & Approval	For Records
1	UPS Bidder to submit “End user certificate” for at least one industrial UPS of ratings of 25 KVA, 10KVA & 5 KVA, each manufactured by Bidder successfully operating in the field for at least 8000 hours or more as on date of issue of inquiry (certificate from end user issued to UPS manufacturer) along with the technical specification & approved drawings/data sheets of the that UPS.	*		
2	Confirmation from UPS manufacturer that offered UPS are from their existing regular manufacturing range.	*		
3	Bill of material		*	*
4	Schematic / Logic diagrams between package equipment		*	
5	Interconnection diagram, terminal block and wiring diagram		*	
6	Cable schedule showing location of terminal, termination details.		*	
7	Testing procedure and quality assurance procedure		*	
8	Commissioning procedure		*	
9	PG test procedure & record formats		*	
10	Operation and maintenance manual		*	*
11	Type test certificates	*		
12	Catalogues and brochures for UPS		*	*
13	Instruction for storage of electrical equipment at site	*		
14	Inspection & Test plan		*	
15	Under taking from vendor for availability of spares & support for next 15 years	*		

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Notes

1. * Data Required
2. All documents shall be in English Language.
3. Post order documents for review / records shall be submitted within four weeks of release of letter of intent unless otherwise agreed.
4. Documents for review and documents for records shall be submitted in separate folders and under separate covering letter to facilitate processing by the company.
5. As a part of the contractual obligations, final documents shall be duly bound under hard cover with clear identification of the equipment tag no, PR no, client details and the name of the project.
6. Review of the vendor drawings by MECON would be only to check compatibility with basic designs and concepts, and would in no way absolve the manufacturer of his responsibility to meet applicable codes, specification and statutory rules and regulations existing system requirement.


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Annexure-II


SCADA COMMUNICATION AND MAPPING DETAILS

Dedicated RS485 Interface port to be provided for SCADA communication apart from local diagnostic port. Modbus RTU protocol will be the communication protocol between UPS and RTU. Below mentioned parameter needs to be configured in contiguous Modbus register by UPS vendor for SCADA as per Modbus Register Address mentioned below.


STANDARDIZED UPS PARAMETER FOR SCADA							
Sr. No.	Terminals with Power Source as UPS with Grid	Signal Type	Modbus Start Addr	Modbus End Addr	Read / Write	HISTOGRAMS REQUIRED	REMARKS
UPS-1 (Modbus Device Address 1)							
Analog Parameters (Two 16 bit register to map one float parameter)							
1	Incoming Voltage Phase 1	Serial	1	2	Read	NO	
2	Incoming Voltage Phase 2	Serial	3	4	Read	NO	
3	Incoming Voltage Phase 3	Serial	5	6	Read	NO	
4	Incoming Current Phase 1	Serial	7	8	Read	NO	
5	Incoming Current Phase 2	Serial	9	10	Read	NO	
6	Incoming Current Phase 3	Serial	11	12	Read	NO	
7	Output Voltage	Serial	13	14	Read	NO	
8	Output Current	Serial	15	16	Read	NO	
9	Output Frequency	Serial	17	18	Read	NO	
10	UPS Output Power (In KVA)	Serial	19	20	Read	NO	
11	UPS Output Power (In KW)	Serial	21	22	Read	NO	
12	Rectifier Voltage	Serial	23	24	Read	NO	
13	Battery Voltage	Serial	25	26	Read	NO	
14	Battery Current	Serial	27	28	Read	NO	
DIGITAL							
1	Battery Status	Serial	29	30	Read	NO	0 - None / 1 - Battery Charging / 2 - Battery Discharging
2	MAINS HIGH	Serial					0 – Main's Normal 1 – Main's volt greater then Main's High volt reference

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3	MAINS LOW	Serial					0 – Main's Normal 1 – Main's volt less then Main's Low volt reference
4	MAINS FREQ O TOL	Serial					0 – Main's Freq within Tolerance 1 – Main's Freq Out of Tolerance
5	MAIN'S FAIL	Serial					0 - Normal, 1 – Main's Fail
6	RECT OVER TEMP	Serial					0 -Rectifier Temperature Normal 1 – Rectifier Temperatue High
7	MAINS LOW TRIP	Serial					0 - Normal 1 – Rectifier Trip Due to Main's Low
8	MAINS HIGH TRIP	Serial					0 - Normal 1 – Rectifier Trip Due to Main's High
9	LOW BATTERY TRIP	Serial					0 - Battery Voltage normal 1 - Battery Disconnected due to low voltage
10	LOAD ON BYPASS	Serial					0 - Load is not on Bypass 1 - Load is on Bypass
11	OUT LOW	Serial					0 – Output Voltage is above then Lower threshold 1 - Output Voltage is Low
12	OUT HIGH	Serial					0 – Output Voltage is below then Higher threshold 1 - Output Voltage is High
13	INV TRIP	Serial					0 - Inverter is not tripped 1 - Inverter is tripped
14	UPS OVERLOAD	Serial					0 - No Overload on UPS 1 - UPS is Overloaded
15	LOW BATTERY	Serial					0 - Battery Voltage normal 1 - Low battery voltage
16	SC COMM FAIL	Serial					0 - Communication between the Control Card & UI Card is OK 1 - Communication Fail between the Control Card & UI Card.

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UPS-2 (Modbus Device Address 2)							
1	Incoming Voltage Phase 1	Serial	1	2	Read	NO	
2	Incoming Voltage Phase 2	Serial	3	4	Read	NO	
3	Incoming Voltage Phase 3	Serial	5	6	Read	NO	
4	Incoming Current Phase 1	Serial	7	8	Read	NO	
5	Incoming Current Phase 2	Serial	9	10	Read	NO	
6	Incoming Current Phase 3	Serial	11	12	Read	NO	
7	Output Voltage	Serial	13	14	Read	NO	
8	Output Current	Serial	15	16	Read	NO	
9	Output Frequency	Serial	17	18	Read	NO	
10	UPS Output Power (In KVA)	Serial	19	20	Read	NO	
11	UPS Output Power (In KW)	Serial	21	22	Read	NO	
12	Rectifier Voltage	Serial	23	24	Read	NO	
13	Battery Voltage	Serial	25	26	Read	NO	0 - None / 1 - Battery Charging / 2 - Battery Discharging
14	Battery Current	Serial	27	28	Read	NO	
DIGITAL							
1	Battery Status	Serial	29	30	Read	NO	0 - None / 1 - Battery Charging / 2 - Battery Discharging
2	MAINS HIGH	Serial					0 – Main's Normal 1 – Main's volt greater then Main's High volt reference
3	MAINS LOW	Serial					0 – Main's Normal 1 – Main's volt less then Main's Low volt reference
4	MAINS FREQ O TOL	Serial					0 – Main's Freq within Tolerance 1 – Main's Freq Out of Tolerance
5	MAIN'S FAIL	Serial					0 - Normal, 1 – Main's Fail
6	RECT OVER TEMP	Serial					0 -Rectifier Temperature Normal 1 – Rectifier Temperatue High
7	MAINS LOW TRIP	Serial					0 - Normal 1 – Rectifier Trip Due to Main's Low
8	MAINS HIGH TRIP	Serial					0 - Normal 1 – Rectifier Trip Due to Main's High
9	LOW BATTERY TRIP	Serial					0 - Battery Voltage normal 1 - Battery Disconnected due to

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							low voltage
10	LOAD ON BYPASS	Serial					0 - Load is not on Bypass 1 - Load is on Bypass
11	OUT LOW	Serial					0 - Output Voltage is above then Lower threshold 1 - Output Voltage is Low
12	OUT HIGH	Serial					0 - Output Voltage is below then Higher threshold 1 - Output Voltage is High
13	INV TRIP	Serial					0 - Inverter is not tripped 1 - Inverter is tripped
14	UPS OVERLOAD	Serial					0 - No Overload on UPS 1 - UPS is Overloaded
15	LOW BATTERY	Serial					0 - Battery Voltage normal 1 - Low battery voltage
16	SC COMM FAIL	Serial					0 - Communication between the Control Card & UI Card is OK 1 - Communication Fail between the Control Card & UI Card.
	Hardwire Signals						
	UPS-1						
1	Rectifier Trip	Hardwire DI					
2	Inverter Trip	Hardwire DI					
3	Battery Discharge (Load on Battery)	Hardwire DI					
4	Load On Bypass	Hardwire DI					
5	Common Alarm	Hardwire DI					
	UPS-2						
1	Rectifier Trip	Hardwire DI					
2	Inverter Trip	Hardwire DI					
3	Battery Discharge (Load on Battery)	Hardwire DI					
4	Load On Bypass	Hardwire DI					
5	Common Alarm	Hardwire DI					
	Common for UPS-1 &						

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UPS 2							
1	24V DC Voltage	Hardwire AI					Load Voltage and Load Current
2	24V DC Current	Hardwire AI					
3	48V DC Voltage	Hardwire AI					
4	48V DC Voltage	Hardwire AI					
COMMUNICATION PARAMETERS FOR EACH UPS - Modbus Slave Address 1(1&2-for two UPS)							
PROTOCOL	INTERFACE	Baud Rate	Data Bits	Parity	Stop Bit		
MODBUS RTU	RS 485	9600	8	None	1		


Modbus Communication Details for SCADA

Interface : RS 485 Protocol : Modicon Modbus RTU

Baud Rate - 9600, Data Bits – 8, Stop Bits – 1 , Parity - None

Modbus Device Address : 1 (In case of two UPS then 1 & 2)

-X-X-X-

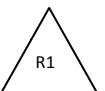
<p style="text-align: center;">MECON LIMITED</p> <p style="text-align: center;">DELHI</p>	<p style="text-align: center;">Electrical Section, Delhi</p>	<p style="text-align: center;">UPS SYSTEM FOR NORTH EAST GAS GRID PIPELINE PROJECT</p> <p style="text-align: center;">Section 1,2,3,4,5,6,7,8,9,12,13&14</p>	
<p style="text-align: center;">SCOPE OF WORK FOR UPS SYSTEM</p>		<p style="text-align: center;">MEC/23UU/05/E9/E/UPS/001</p>	<p style="text-align: center;">Page 1 of 2</p>


Annexure-III- Scope of works AMC of UPS for 5 year

COMPREHENSIVE ANNUAL MAINTENANCE CONTRACT (CAMC):

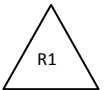
The UPS system is to be maintained for a period of five years after the expiry of warranty period as per the details given below:

- After expiry of warranty period, Cost of all spares, consumables, equipment, instruments & services, to take care of maintenance (Preventive & Breakdown), including all statutory taxes and duties including entry tax, service tax etc. has to be borne by the Vendor during the CAMC period. In case of failure to attend within 2 days, these will be attended through alternate agency at vendor's risk and cost.
- Four Nos. normal visits (once in three months) per annum for carrying out regular maintenance work, for checking the operation of system and do preventive maintenance and Four No. emergency visits per annum (as & when required) are included in scope of C.A.M.C (Annual Maintenance Contract) at each location. M/s IGGL will have the right to reschedule the visits and adjust the total no. of regular and emergency visits. Each Visit shall conclude only after the deliverables are achieved as per the approved check list/work specified by IGGL before start of the visit.
- During warrantee and AMC period, any replacement of parts/rectification shall form an integral part of the contract and agreed contract price. Since the equipment is under warranty and CAMC obligations, no extra payment towards replacement of components, parts etc shall be allowed.
- The effective date of Annual Maintenance Contract shall be from the date of successful completion of warranty period as per contract and on request from the purchaser. During regular maintenance / breakdown visits any replacement/consumable required will be provided by the Vendor.
- The vendor's service engineer will check and service supplied UPS System, rectifiers, converters, DBs and all its associated electronics & magnetic, installed under this contract and its accessories and maintain them in good working condition. Any consumables required for servicing the equipment shall be arranged by the Vendor at no extra cost to IGGL during CAMC.
- Vendor shall ensure availability of consumables and critical spares for smooth working of UPS systems during CAMC. The vendor should do proper spares management by carrying out periodical testing of the spares, safeguards against obsolescence, any up gradation, timely replenishment, etc.
- IGGL can terminate the annual maintenance contract by giving One months' notice in advance to the vendor for CAMC.
- In case the Bidder does not undertake the AMC contract later when awarded or does not abide by the terms of the contract for supply of spares as well as the AMC contract, then IGGL reserves the right to encash the performance bank guarantee available with them besides blacklisting and putting the Bidder on holiday list of IGGL for a period of five years.



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- Any software upgrades required shall be included in the scope of the Bidder during annual maintenance. The Bidder shall seek permission from the Project / Terminal incharge before loading the new version of the software in the clients / server. The data backup shall be taken before upgrading the software. If during CAMC /Warranty period a new version of Software is released by the Vendor/ OEM, the same is to be updated at the location without any additional charges.
- If new OS, say Windows 10 or above is introduced by IGGL for the automation system, the UPS system shall be integrated with the same within a reasonable time period and without any cost implication to IGGL.
- The vendor shall ensure availability of spares for the supplied UPS System, rectifiers, converters and all its associated electronics, for a minimum period of 15 years after warranty period. In the event of non-availability of spares due to fast obsolescence of hardware and software, the vendor shall arrange to upgrade/ replace the equipment's with equivalent or higher hardware and software at no additional cost till end of CAMC period for the items supplied by the Vendor.
- The Vendor must note that all commissioning spares and the spares / consumables during warranty and comprehensive CAMC shall be supplied by the vendor free of cost.
- For payment terms and penalty clauses refer the annexure to SCC-Payment Terms (Annexure-5 to SCC).
- Bids will be evaluated taking into account the charges towards CAMC for 5 years. However IGGL reserves the right to award the CAMC contract & these items subsequently at the end of the warranty period or earlier.
- For all Windows OS & other Microsoft product, the security/ functionality patches which are mandatory in nature shall be upgraded /installed in all machines during project execution, system stabilization, warranty & CAMC. Vendor shall carry out such updates in coordination with IGGL. Using IGGL's software deployment/ upgrade infrastructure.
- CAMC shall include all the materials, items and services supplied by the Bidder including the Battery bank.
- **During the CAMC period bidder scope shall also include the regular checking of the Battery bank and its preventive maintenance per visit and annual capacity test of the bank and replacement of the faulty battery cell as per the capacity test reports.**



Battery cell replacement shall be carried out by M/s IGGL as per the capacity test report. Prices of replacement of the all faulty other parts/system other than Battery is included in the CAMC.

ANNECURE-III to CORRIGENDUM 2

REV. : 4


Edition : 1

**DATA SHEET
FOR
UN-INTERRUPTED POWER SUPPLY (UPS)
SYSTEM**

SPECIFICATION NO.- MEC/DS/05/E9/071



**(OIL & GAS SBU)
MECON LIMITED
DELHI 110092**

MECON LIMITED REGD. OFF: RANCHI 834002	STANDARD DATA SHEET		
	ELECTRICAL SECTION, DELHI		
TITLE	UNINTERRUPTED POWER SUPPLY (UPS)	DOCUMENT NO. MEC/DS/05/E9/071	Page 1 of 14
			REVISION : 3
			EDITION : 1

ANNEXURE-I

PURCHASER'S DATA FOR UPS

1.0 INPUT POWER SUPPLY

1.1	Voltage/freq./ phase:	415 V (+) 10% & (-)15%, TPN, 50 Hz \pm 5% or 230V AC single phase (voltage range-To be provided by Bidder) As per SOR
1.2	System fault level	10 kA for 1 Sec

2.0 SITE CONDITION


2.1	Design Maximum / Minimum temperature	50 ⁰ C/2 ⁰ C
2.2	Max. Relative Humidity	95%
2.3	Altitude	Below 1000.0 M MSL

3.0 OUT PUT REQUIREMENT


3.1	Voltage/ Phase	230V \pm 1% AC, Single phase 2 wire
3.2	Output waveform & frequency	Pure Sinusoidal Wave
		50 Hz \pm 0.1%
		Voltage distortion (THD): Less than 3% for linear loads & Less than 5% for non linear loads.

4.0 SYSTEM REQUIREMENTS


4.1	Rating KVA	As per SOR
4.2	Type of inverter	The inverter circuit should be IGBT based, fully microprocessor controlled with PWM Technology or Latest proven technology
4.3	Overload capacity	125% of the rated output for 10 minutes & 150% for 1 minute.
4.4	Mode of operation	Dual/Parallel Redundant with static bypass & Dual Redundant rectifier as specified in SOR/Design basis/Block diagram
4.5	Inverter efficiency	>85% at 100% of load and >80% at 25% of load
4.6	Installation	Floor Mounted
4.7	Type of enclosure	Minimum IP-31
4.8	External Cable Connection	From Bottom
4.9	Internal protection	All live parts shrouded
4.10	Earthing	Doubly Earthed (Two distinct terminals to be made available)
4.11	Cooling	Forced ventilation with fans

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4.12	Noise Level	<ul style="list-style-type: none"> <65 dB at full Load from 1 mtr distance (for UPS of rating 5kVA, 7.5kVA & 10kVA) <75 dB at full Load from 1 mtr distance (for UPS of rating 15kVA & 25kVA)
4.13	Crest Factor	≥3:1
4.14	Input Power Factor	> 0.95
4.15	Load Power Factor	0.8 (with variation between 0.6 to 1.0)
4.16	Overall efficiency	> 80%
4.17	Harmonics	As per IEEE 519 (Total demand distortion not more than 5.0%)
5.0 Rectifier/Charger		
5.1	Input voltage	415 V (+) 10% & (-) 15%, TPN, 50 Hz ± 5% or 230V AC single phase (voltage range-160V AC to 270V AC) or 230V ± 1% AC from UPS (As per SOR).
5.2	Automatic phase selection device	As per SOR
5.3	Output DC voltage/Load	As per Manufacturer Design
5.4	Input Power factor	> 0.95 at rated load
5.5	Input current THD (Total Harmonic Distortion) at nominal load	≤ 5 %
5.6	Overload Capability	125% minimum for 10 min. 150% minimum for 1 min
5.7	Inrush current	Limited by soft-start circuit
5.8	Output voltage tolerance	+/- 1%
5.9	DC voltage ripple	<1% With battery connected <2% Without battery connected
5.10	Rectifier	IGBT based
5.11	Filter	Input side line filter
5.12	Harmonics	As per IEEE-519 (Voltage THD <5%, largest single voltage harmonics <3%, Input Current THDi <5%)
5.13	Charging	Automatic Float and Boost charging (selection as per battery charging state (voltage level))
6.0 Bypass		
6.1	Automatic Bypass	Static bypass to provide an un interruptible transfer of load in case of failure of any system component or malfunctioning or overload & the load shall return on the UPS when the malfunctioning or overload is cleared
6.2	Input connection	Separate for each UPS

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6.3	The switching time from inverter to bypass & vice versa	No break type
6.4	Manual/Maintenance Bypass	Shall be provided
6.5	Overload on bypass	125% minimum for 10 min. 150% minimum for 1 min.
6.6	Connectivity	Ethernet / Preferably Modbus RS 485 (To be decided during detailed engineering)
7.0 Battery Bank		
7.1	Type of Battery	As per SOR
7.2	Battery Arrangement	2 X 50%
7.3	i) Battery end cell voltage ii) Battery stand formation iii) Battery back up time iv) De-rating factor	As per specification (clause no. 3.5) As per battery manufacturer As per SOR (i) Ageing -- 0.8 (ii) State of Charge -- 0.88 (iii) Temp. Correction -- As per min. site temp. (Ref. 2.1 above) The rectifier/charger output current & voltage shall be limited to the battery supplier's recommendation.
8.0 Alarms, Indications and LCD Display		
8.1	Single line Power Flow Diagram (Mimic diagram) with LED indications of UPS status (i.e. Mains present, Battery charging & discharging, Low battery Voltage and unit on bypass).	
8.2	Digital panel Meter with LCD display (touch screen / touch pad) shall be provided for monitoring viz.	a) Input AC Voltage, current, frequency b) Output AC Voltage, current, frequency. c) Battery current and voltage d) Total run time e) Mains ON/OFF/TRIP, Mains Over/Under voltage, Phase fail f) Inverter ON/OFF, Inverter Over/Under voltage, inverter overload, over heat & load in % on inverter. g) Battery voltage low, Battery AH in % h) Battery Operation Boost Charge, Float Charge with of status - "in charge" or "discharge" i) Load on bypass or inverter. Detailed UPS Status with Operation/faults history
8.3	Audible Alarms With LCD Display-	a) Mains Failure b) Battery Low c) UPS fault (Continuous) d) Inverter Under-voltage e) Over Temperature (Continuous) f) Inverter Overload (Continuous)


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9.0 Protective Features

9.1	Input	Mains Over voltage, under voltage, phase failure
9.2	Inverter	Over voltage, short circuit, overload, over temperature
9.3	Battery	Under voltage at battery terminal, Battery over charge, Battery Over current
9.4	Rectifier & Battery charger	Maximum current limiting Over temp. Trip Boost charging and float charging current limiting with back up protection against over charging.


10.0 Distribution boxes

10.1	Distribution Board Details 	(As per tender drawings / SOR) (1)ACDB 230V, Single Phase (1 No.) : Incomer: 63A/100A/160A MCCB (As per UPS capacity 5KVA/10KVA/25 KVA) or more for higher capacity UPS. Outgoing: Combination of DP MCB's : 5KVA UPS System- 32A MCB DP-5 nos., 16A MCB-4 nos., 10A MCB- 5 Nos. 6A DP MCB- 6 nos. (The rating of above mentioned feeders may change during detail engineering, Bidder shall provide all required feeders as per requirement without any financial implications.) 10KVA UPS System- 32A MCB DP-5 nos., 16A MCB-6 nos., 10A MCB- 8 Nos. 6A DP MCB- 8 nos. (The rating of above mentioned feeders may change during detail engineering, Bidder shall provide all required feeders as per requirement without any financial implications.) 25KVA UPS System- 63A MCB DP- 03 nos., 32A MCB DP-5 nos., 16A MCB-8 nos., 10A MCB- 10 Nos. 6A DP MCB- 10 nos. (The rating of above mentioned feeders may change during detail engineering, Bidder shall provide all required feeders as per requirement without any financial implications.)
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11.0	Battery Monitoring System	Yes with communication
12.0	UPS communication	Ethernet / preferably Modbus RS 485 (To be decided during detailed engineering)
13.0	Selector switch	For Auto manual switch for Float and boost selection
14.0	Toggle switch	Float and Boost selection


TECHNICAL DATA FROM MANUFACTURER (To be filled up by the Tenderer)		ANNEXURE-II (A)
1.0	INVERTER	
1.1	Manufacturer's Model No. (Enclose catalogue)	

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1.2	Rating (at specified ambient) / no. of phases	
1.3	Applicable codes/standards	
1.4	Steady state output volt/freq (230 V \pm 1%) (50 Hz \pm 0.1%)	
1.5	Input voltage - DC	
1.6	Synchronization (inv. phase locked with main) in percentage	
1.7	Synchronization manually adjustable in steps of	
1.8	Allowable unbalance between phases (for 3 Phases only)	
1.9	Harmonics distortion for linear & non-linear loads	
1.10	Mode of operation	Dual/Parallel Redundant with static bypass as specified in SOR /Design basis/Block diagram
1.11	Dynamic Responses at following conditions a) \pm 50% step load (for parallel redundant UPS) b) \pm 100% step load (for hot standby and single UPS system). c) Power supply interruption and restoration. d) Load Transferred to bypass line e) When one inv. gets faulty and load transferred to healthy inv. (for parallel redundant UPS)	
1.12	Recovery time to reach steady state after above disturbance (not more than 100m Sec)	
1.13	Overload capacity (125% minimum for 10 min. 150% minimum for 1 min.)	
1.14	Short circuit capacity and duration (in % and m sec.)	
1.15	Noise Level (dB at 1 m) • <65 dB at full Load from 1 mtr distance (for UPS of rating 5kVA, 7.5kVA & 10kVA) • <75 dB at full Load from 1 mtr distance (for UPS of rating 15kVA & 25kVA)	
1.16	Efficiency at 100%/75%/50% loads (not less than 85% at 100% load)	

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1.17	Type of control circuit	
1.18	Out put voltage & phase angle (for 3 Phase only) a) For 30% unbalance load b) For 40% unbalance load c) For 50% unbalance load d) For 100% unbalance load	
1.19	Crest Factors	
2.0 STATIC SWITCHES		
2.1	Nos. of static switches in each set	
2.2	Current rating at specified ambient	
2.3	Transfer time (m sec.) a) Synchronized mode (not more than 4msec) b) Unsynchronized mode (not more than 20msec)	
3.0 BATTERY CHARGER		
3.1	Rating (Amp.) / MAKE (Enclose back up calculation).	
3.2	Type of charger (Basic configuration)	
3.3	Output volt under float/boost charging condition	
3.4	Volt. Accuracy under specified input ($\pm 1\%$)	
3.5	Max. Ripple content on DC side (% RMS) (not more than 2% without battery & 1% with battery connected)	
3.6	Efficiency at 100%/75%/50 % of load	
3.7	Mode of Change over from float to boost and vice-versa	
4.0 BATTERY		
4.1	Make	
4.2	Type (Enclose catalogue)	
4.3	AH rating (Enclose back up calculation)	
4.4	End cell voltage at specified discharge rate (V/ cell)	
4.5	Output (Nominal) volts	
4.6	Nos. of battery banks	
4.7	Nos. of cells in each banks	
4.8	Battery charging requirements (V/ cell)	


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	a) Volts/Cell/Nominal b) Float c) Boost	
4.9	Voltage variation from fully charged battery to discharged battery (volts)	
4.10	Charging time (Hrs.)	
4.11	Max. Permissible ripple content (% RMS)	
4.12	Overall dimension (L*W*H)	
4.13	Container type	
4.14	Accessories for battery as per specification included	Cell testing Voltmeter, Pair of Gloves, Insulated Spanner, Extra Electrolyte, Hydrometer, Thermometer etc.
4.15	Type/Formation of battery stand	
5.0 MANUAL TRANSFER DEVICES		
5.1	Rating (Amp.)	.
5.2	Make/Type	
6.0 STEP DOWN BYPASS TRANSFORMER WITH SOLID STATE VOLTAGE STABILISER		
6.1	Make/type	
6.2	Rating and Voltage ratio	
6.3	Accuracy of stabilizer (not more than $\pm 2\%$)	
6.4	Type of control (Solid state)	
6.5	Type of cooling	Natural
7.0 AC DISTRIBUTION BOARD		
7.1	Nos. of feeder/rating	
7.2	Cable entry from (Bottom)	
7.3	Max. Rating of outgoing feeders possible for fault clearance by UPS with and without supply back up (as percentage of UPS rating) not less than 25% a) With fast acting semi conducting fuses	
8.0	Indications and Alarm	
9.0	Metering	
10.0	UPS Dimension (L x W x H) except Battery:	

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	(Including inverter, charger, rectifier, bypass stabilizer, ACDB etc.)	
11.0	OVERALL EFFICIENCY OF UPS SYSTEM	
11.1	Ratio of output load to input drawn from mains when inverters are on and synchronized with bypass. a) At 100% load b) At 75% load c) At 50% load	
12.0	RELIABILITY a) Safety factor used for selecting electronic components/ other electrical components (not less than 200%/ 125% respectively) b) MTBF / MTRF c) Availability factor	
13.0	DEGREE OF PROTECTION OF THE PANEL (Minimum IP – 31)	
14.0	Heat loss for total system (W)	
15.0	Potential free contracts (for duplicating of fault status in remote panel).	
16.0	Fault status shall be compatible to hook-up with Owner's PC through Ethernet/ preferably RS 485 interface (To be decided during detailed engineering).	

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<u>TECHNICAL DATA FROM MANUFACTURER</u>		ANNEXURE- II (B)
1.0	2x100% RECTIFIER UNITS	
1.1	Mains Input	
	a) Voltage & Frequency	415 V (+) 10% & (-) 15%, TPN, 50 Hz \pm 5% or Power supply details mentioned in SOR or 230V AC single phase (voltage range-160V AC to 270V AC) or 230V \pm 1% AC from UPS. (Rectifiers 24V & 48V may be fed from UPS AC output).
	b) Input harmonics (max.) at full load.	5% RMS (Voltage)
1.2	Out put details	
1.2.1	Rectifier	
	a) Voltage / Wattage	<p>24 VDC & 48V DC, Rating as per SOR with input variation of +/-10%. Feeder details :  5 & 10 KVA UPS Rectifier Input - 32A DP MCB Rectifier Output- As per load & Voltage rating DCDB Outgoing feeders (MCB) – 10A DP MCB- 05 nos.16A DP- 5Nos., 20A DP- 5Nos. & 32A DP-5 Nos.</p> <p>(-) 48 V DC, rating as per SOR with input variation of +/-10%. Rectifier Input - 32A Rectifier Output- As per load & Voltage rating DCDB Outgoing feeders (MCB) – 10A DP MCB- 05 nos.16A DP- 5Nos., 20A DP- 5Nos. & 32A DP-5 Nos.</p>
		<p>25 KVA UPS Rectifier Input - 32A DP MCB Rectifier Output- As per load & Voltage rating DCDB Outgoing feeders (MCB) – 10A DP MCB- 05 nos.16A DP- 5Nos., 20A DP- 5Nos. & 32A DP-5 Nos, 63A DP, 04 nos..</p> <p>(-) 48 V DC, rating as per SOR with input variation of +/-10%. Rectifier Input - 32A Rectifier Output- As per load & Voltage rating DCDB Outgoing feeders (MCB) – – 10A DP MCB- 05 nos.16A DP- 5Nos., 20A DP, 5Nos.</p>

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		& 32A DP-5 Nos, 63A DP, 04 nos.
	b) Method of Voltage /Current Control	Static
1.2.2	Load Bus	
	a) Voltage Regulation from Full load to no load (for mains variation of $\pm 10\%$)	$\pm 5\%$
	b) Ripple Content (<30 mV)	
	c) Rating of Double pole MCB and fuses for DCDB	(DP MCB's with semiconductor fuses and DC bus for 4 outgoing feeders)
1.3	Efficiency of Rectifier (at 50%, 75%, 100% load)	
1.4	Power Factor of Rectifier (at all load)	0.6 to 0.7 (lag)
1.5	Annunciator details	
	a) Audio – Visual	DC over voltage Rectifier Failure Load C.B. Trip
	b) Push buttons	Acknowledge, reset
	c) Remote	One no. potential free common alarm annunciation contact.
1.6	Indication Lamps	AC Power ON, Rectifier ON
1.7	Meters	A.C. input ammeter and voltmeter. Output ammeter and voltmeter.
1.8	MTBF (Hrs.)	60,000 Hrs.
1.9	MTTR (Hrs.)	4 Hrs. (Approx.)
1.10	PTRV (Peak Transient reverse voltage)	600 V on AC side 200 V on DC side
1.11	Construction Details	
	a) Type of Cooling	Natural
	b) Cable entry	Same as UPS Panel
	c) Access	Same as UPS Panel
	d) Painting	Same as UPS Panel
	e) Degree of Protection	Same as UPS Panel
1.12	Safety Factor	2

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ANNEXURE - III

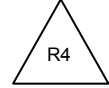
CHECK LIST (To be submit along with Datasheets)

SI. No	Description	REMARKS
1	Deviation from specification	
2	Charger sizing calculation enclosed	
3	Battery sizing calculation enclosed	
4	Battery catalogue enclosed	
5	UPS Panel Catalogue enclosed	
6	Confirm compliance to Block diagram	
7	Confirm Inspection for UPS and battery as per specification.	
8	Dimension for UPS Panel, rectifier and Battery Bank enclosed.	
9	Break up for two years operation & maintenance spares enclosed for UPS & Rectifier	


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ANNEXURE – IV

LIST OF TWO YEAR OPERATION & MAINTENANCE SPARES



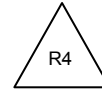
Sl No.	Description	UOM	Quantity					
			Assam	Meghalaya	Tripura	Mizoram	Nagaland	Arunachal Pradesh
5 KVA UPS System								
1	IGBT (5 KVA)	Sets	8	1	2	1	1	-
2	Rectifier/ Charger Card* (5 KVA)	Sets	8	1	2	1	1	-
3	Inverter Card* (5 KVA)	Sets	8	1	2	1	1	-
4	Power supply card* (5 KVA)	Sets	8	1	2	1	1	-
5	DC-DC Converter card* (5 KVA)	Sets	8	1	2	1	1	-
6	Fuse & Indication lights of all ratings**	Sets	8	1	2	1	1	-
7	MCB's*, Contactors** MCCB's*, Relays** (5 KVA)	Sets	8	1	2	1	1	-
8	Cooling fan	Nos.	8	1	2	1	1	-
10 KVA UPS System								
9	IGBT (10 KVA)	Sets	1	1	2	-	-	1
10	Rectifier/ Charger Card* (10 KVA)	Sets	1	1	2	-	-	1
11	Inverter Card* (10 KVA)	Sets	1	1	2	-	-	1
12	Power supply card* (10 KVA)	Sets	1	1	2	-	-	1
13	DC-DC Converter card* (10 KVA)	Sets	1	1	2	-	-	1
14	Fuse & Indication lights of all ratings**	Sets	1	1	2	-	-	1
15	MCB's*, Contactors** MCCB's*, Relays** (10 KVA)	Sets	1	1	2	-	-	1
16	Cooling fan	Nos.	1	1	2	-	-	1
25 KVA UPS System								
17	IGBT (25 KVA)	Sets	3	-	-	-	-	
18	Rectifier/ Charger Card* (25 KVA)	Sets	3					
19	Inverter Card* (25 KVA)	Sets	3	-	-	-	-	

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20	Power supply card* (25 KVA)	Sets	3					
21	DC-DC Converter card* (25 KVA)	Sets	3	-	-	-	-	
22	Fuse & Indication lights of all ratings**	Sets	3	-	-	-	-	
23	MCB's*, Contactors** MCCB's*, Relays** (25KVA)	Sets	3	-	-	-	-	
24	Cooling fan	Nos.	3	-	-	-	-	

(1) * 1 Set=One of card of each rating/type of each rating UPS

(2) ** 1 Set= 10% of each rating (minimum two number) of each type of UPS



Note: Prices of 02 year O&M spares are inclusive of prices quoted by the Bidder for the UPS system.

-X-X-X-