RAILTEL CORPORATION OF INDIA LIMITED

(A Govt. of India Enterprise)

Western Railway Microwave Complex,
Senapati Bapat Marg, Mahalaxmi, Mumbai-400013.

No. RailTel/Tender/OT/WR/HQ/UPS/2015-16/29 **Date-01.10.15**

Corrigendum – IV

Sub :- Tender for "Supply, Installation, Testing & Commissioning of 60KVA online Uninterrupted Power Supply (UPS) System (with Batteries) at Mumbai, Kolkatta, Secunderabad, Chennai and New Delhi and Comprehensive AMC for three years".

Ref:- 1. Open Tender No. RailTel/Tender/OT/WR/HQ/UPS/2015-16/29 dt.14.08.15
2. Corrigendum-I dt. 24.08.15
3. Corrigendum-II dt. 14.09.15
4. Corrigendum-III dt. 21.09.15

In reference to the above referred tender, the following amendment is issued in the tender document. The bid may be submitted in consideration of these amendments.

1. Chapter 1, Preamble, Clause No.1.1 (Page No.8)

In the original tender "

Scope of work:

RailTel Corporation of India Limited desires to procure 10 No. of 60 KVA UPS along with batteries which can provide backup of 1 hours to run Networking Equipments like Routers, Switches etc. in Mumbai, Delhi, Kolkata ,Chennai and Secunderabad. All the 10 systems will be distributed in 5 pairs and are intended to work in 1+1 configuration with 1 UPS and battery working as main and the other UPS and battery working as standby. The exact distribution of the systems in given in Chapter-II Schedule-C.

RailTel also intends to award CAMC of the UPS and batteries supplied under the contract for a period of 3 years after the completion of warranty period.

The tenderer should satisfy the technical and financial capabilities stipulated in the tender.

Broad Responsibility of the Tenderer under the scope of the work is as under:-

a) Supply :- Supply of 10 No. of UPS along with batteries which can provide backup of 1 hour. All the accessories like Power Cables, Earthing cables, Load Cables, ACDBs, MCBs, Changing Over Units so that UPS can work in 1+1 mode and all the other material so as to achieve the end objective will be supplied by the Contractor. RailTel will only give a point in the main power panel from where the contractor will install its own ACDB and carry the power to the supplied UPS.

b) Services :- Before supply of material contractor will invite RailTel Executive to carry out Factory Acceptance Test in the premises of the contractor/OEM so as to check the parameters which are mentioned in Compliance Sheet available as Form-17 in Chapter- VI. This test will be arranged by Contractor at no extra cost.
Contractor will install, test and commission the UPS and its batteries within stipulated timeline of 60 days from the issue of LOA. Commissioning includes all material which are being supplied "

Now should be read as "

Scope of work:

RailTel Corporation of India Limited desires to procure 10 Nos. of 60 KVA UPS along with batteries which can provide backup of minimum 1 hours to run Networking Equipments like Routers, Switches etc. in Mumbai, Delhi, Kolkata ,Chennai and Secunderabad. All the 10 systems will be distributed in 5 pairs and are intended to work in 1+1 Parallel (sharing approx. 50% load each) redundant Configuration. The exact distribution of the systems is given in Chapter-II, Schedule-C.

RailTel also intends to award CAMC of the UPS, battery and accessories supplied under the contract for a period of 3 years after the completion of warranty period.

The tenderer should satisfy the technical and financial capabilities stipulated in the tender.

Broad Responsibility of the Tenderer under the scope of the work is as under:-

a) *Supply :- Supply of 10 Nos. of UPS along with batteries which can provide backup of minimum 1 hour. All the accessories like Power Cables, Earthing cables, Load Cables, ACDBs, MCCBs, Changing Over Units, copper lugs etc. and all the other material will be supplied by the Contractor so as to achieve the end objective. The UPSs shall work in 1+1 Parallel (sharing approx. 50% load each) redundant Configuration. RailTel will only give a point in the main power panel from where the contractor will install its own ACDB and carry the power to the supplied UPSs.*

b) *Services :- Before supply of material contractor will invite RailTel Executive to carry out Factory Acceptance Test in the premises of the contractor/OEM so as to check the parameters which are mentioned in Compliance Sheet available as Form-17 in Chapter- VI. This test will be arranged by Contractor at no extra cost.*
Contractor will install, test and commission the UPS and its batteries within stipulated timeline of 60 days from the issue of LOA. Commissioning includes all material which are to be supplied"

2. Chapter 2 (Schedule of Requirement)(Page No.13) Schedule-A: Supply of Tender document :-

In the original tender

"

Schedule-A : Supply

SN.	Item Description	Unit	Quantity	All Inclusive Rate (in Rs.)	Amount (in Rs)
	a	b	C	d	e=cxd
a	Supply of 60KVA online UPS, 415V O/P and batteries along with racks etc. and required interconnecting cables (Main Power Panel to UPS, UPS to Load, UPS to Battery, Earthing cable etc.) changeover panel, MCBs, connectors and any other material required to achieve end objective and as per detailed technical specification given in Annex.-I of Chapter-7 and instructions of Engineer-In-Charge.	Nos.	10		

	The decision of Engineer in Charge will be final.				
	Grand Total (in Rs.)(in Figures)				
	In Words				

”

Now should be read as “

Schedule-A : Supply

SN.	Item Description	Unit	Quantity	All Inclusive Rate (in Rs.)	Amount (in Rs)
	a	**b**	**C**	**d**	**e=cxd**
a	Supply of 60KVA online UPS, 415V O/P and batteries along with racks etc., LT panel, changeover switch, SFU, MCCBs, copper lugs, connectors and any other material required to achieve end objective and as per detailed technical specification given in Ann-I of Chapter-7 and instructions of Engineer In Charge. The decision of Engineer in Charge will be final	Nos.	10		
b	Supply of 1100 V Grade Multi core flexible annealed copper conductor, PVC Insulated and sheathed 50 sq. mm 4 core for connecting UPS with Main Power Panel ACDB and UPS to Battery.	Mtr.	300		
c	Supply of 1100 V Grade Multi core flexible annealed copper conductor, PVC Insulated and sheathed cable 50 sq. mm 4 core for connecting UPS with Output ACDB.	Mtr.	200		
d	Supply of Multi Strand Single core flexible annealed copper conductor 1100 V Grade, PVC Insulated and sheathed cable 35 sq. mm single core for connecting UPS with Earth.	Mtr.	200		
e	Supply of Input ACDB. The Main Incomer shall be 250A TPN MCCB & minimum 2 Nos. outgoing of 125A TPN MCCB for UPS input .Drawing to be got approved before fabrication	Nos.	10		
f	Supply of Output ACDB. The Output Paralleling Busbar Panel shall have minimum: 2 No.125A TPN MCCB with common busbar panel.Drawing to be got approved before fabrication.	Nos.	10		

g	Perforated cable tray 150 mm width x 50 mm (side H) alognwith suitable size fixing rod , shell , nuts, bolts etc.	Mtr.	250		
	Grand Total (in Rs.) (in Figures)				
	In Words				

”

3. Chapter 1, Preamble, Clause-1.16 (Page No.10)

In original Tender

“Power supply of 230 volts, 50Hz AC shall be provided at one point in main power panel by RailTel in case of each location.”

Now should be read as

“Power supply of 415 volts, 50Hz AC shall be provided at one point in main power panel by RailTel in case of each location.”

4. Chapter 6, Forms of Tender, Form-17 (Page No.95)

In original tender

“FORM-17
Compliance Sheet

UPS Make :- **Model No.:-**
Battery Make :- **Model No.:-**

Item No.	Description	Requirement	Complied or Not
1	**Technology**	Inverter: Online, Double Conversion, IGBT based PWM technology. Converter :IGBT based converter	
2	**Input**		
	Nominal Voltage	400V (3 ph + N)	
	Input voltage range without battery discharge(on Full Load)	340 to 460V	
	Nominal frequency	50Hz (60 selectable)	
	Frequency range	±10%	
	Power factor @ nominal load & nominal input conditions(on Full Load)	≥ 0.99	
	Input current distortion	≤ 3%	
	AC/DC Rectifier efficiency	95	
3	**Inverter output**		
	Nominal output voltage	400V (380V/415V selectable, 3ph+N)	
	Output waveform	Sine wave	
	Nominal output frequency	50Hz (60 Selectable)	
	Output frequency stability		

	synchronized with bypass mains(%)	±1% (2, 3, 4 selectable)	
	synchronized with internal clock	±0.1	
	Nominal apparent power @ 40°C ambient (kVA)	60KVA	
	Nominal active power (kW)@ 40°C ambient	54KW	
	Power factor	0.9	
	Maximum output power (kVA)@ 40°C ambient	60KVA	
	Voltage stability in steady state condition for input (AC & DC)variations and step load (0 to Nominal load) (%)	+/-1%	
	Voltage stability in dynamic condition for input variation (AC & DC) and step load (0 to Nominal load and vice versa)(%)	Complies with IEC/EN 62040-3, Class 1	
	Voltage stability in steady state for100% load imbalance (0,0,100)(%)	± 2%	
	Output voltage distortion with 100% linear load	<1%	
	Output voltage distortion @ reference non linear load as per IEC/EN 62040-3	<3%	
	Short circuit current for 10 ms/ <5s	300 / 150	
	Load crest factor handled without derating the UPS	3:1	
	Phase angle precision with balanced loads (degrees)	< 1	
	Phase angle precision with 100% unbalanced loads (deg.)	<2	
	DC/AC Inverter efficiency %	95	
	Battery/AC Inverter efficiency%	94	
	Neutral conductor sizing	1.7 nominal current	
4	**Battery**		
	Capacity of UPS	60KVA	
	Backup Time	1 hour for each UPS at full load	
	Battery	Minimum 61000VAH using 12V VRLA battery of reputed brand like Amara Raja,Exide,Panasonic etc.	
	Online Battery Monitoring	Should be available	
	Battery Recharge Time (after complete discharge to 100% charge)	Should not exceed 10 Hours	
	Battery Housing	A suitable Cabinet/Rack to mount VRLA type of batteries	
	Rectifier Characteristics	# Charging voltage 2.23V to 2.3V per cell.	
		# Power Factor 0.98	
		# Charging current is to be limited to protect the Batteries.	
		#Discharge monitoring	
		#Boost Charge option	
5	**Static Bypass**		
	Nominal bypass voltage	400V (380V/415V selectable, 3Ph + N)	
	Voltage range	±10 (5 to 15 selectable)	

	Nominal frequency	50Hz (60 selectable)	
	Frequency range	±1 (2, 3, 4 selectable)	
	Static Switch required-Input Path	Input Path Static Switch-Required Mandatory-Vendor to submit the schematic showing Static switch,If It is not Internal ,Vendor To provide External Static Switch.	
	Static Switch required-Bypass Path	Bypass Path Static Switch-Required Mandatory-Vendor to submit the schematic showing Static switch,If It is not Internal ,Vendor To provide External Static Switch.	
	Static Switch required-Battery Path	Battery Path Static Switch-Required Mandatory-Vendor to submit the schematic showing Static switch,If It is not Internal ,Vendor To provide External Static Switch.	
	Static Switch required-Inverter Path	Inverter Path Static Switch-Required Mandatory-Vendor to submit the schematic showing Static switch,If It is not Internal ,Vendor To provide External Static Switch.	
	Maximum overload capacity		
	- for 10 minutes (%)	125	
	- for 1 minutes (%)	150	
	- for 600 milliseconds (%)	700	
	- for 100 milliseconds (%)	1000	
	Transfer time with inverter synchronous to bypass:		
	- Inverter to Bypass (ms)	no break	
	- Bypass to Inverter (ms)	no break	
	Transfer time with inverter not synchronous to bypass (ms)	<20	
6	**System Data**		
	AC/AC efficiency without charging current	94	
	Noise @ 1 meter as per ISO 3746 (dBA±2dBA)	66	
	Protection degree	IP32	
	Galvanic isolation transformer	Inbuilt Factory fitted transformer in the UPS System. The system must also enable transformer to be connected at either input or output	
7	**Environmental**		
	Temperature (°C)		
	- Operating	0-40	
	- Transportation & Storage	0-55	
	Max. relative humidity @ 20°C (non condensing) (%)	Up to 95	
	Max altitude above sea level without derating (m)	1000 (for higher altitudes complies with IEC/EN 62040-3)	

8	**Certifications**		
	Safety	IEC 62040 - 1	
	EMC Class	EN 50091-2 Class RS	
		IEC 62040 - 2	
	Testing	IEC 62040 - 3	

I hereby certify that the information submitted by me in Form-17 is correct and will be verified to RailTel in Factory Acceptance Test if the order is being placed to my firm. In case of Certifications which are mentioned above, the copy of the certificate issued by the issuing authority mentioning the make and model offered is being submitted for ready reference.

Signature of Authorized Signatory of Contractor

Now should be read as
“

FORM-17
Compliance Sheet

UPS Make :- **Model No.:-**
Battery Make :- **Model No.:-**

Item No.	Description	Requirement	Complied or Not
1	**Technology**	Inverter: Online, Double Conversion, IGBT based PWM technology. Converter : IGBT based converter.	
2	**Input**		
	Nominal Voltage	400V (3 ph + N)	
	Input voltage range without battery discharge(on Full Load)	340 to 460V	
	Nominal frequency	50Hz (60 selectable)	
	Frequency range	±10%	
	Power factor @ nominal load & nominal input conditions(on Full Load)	≥ 0.99	
	Input current distortion	≤ 3%	
	AC/DC Rectifier efficiency	95	
3	**Inverter output**		
	Nominal output voltage	400V (380V/415V selectable, 3ph + N)	
	Output waveform	Sine wave	
	Nominal output frequency	50Hz (60 Selectable)	
	Output frequency stability		
	synchronized with bypass mains(%)	±1% (2, 3, 4 selectable)	
	synchronized with internal clock	±0.1	
	Nominal apparent power @ 40°C ambient (kVA)	60KVA	
	Nominal active power (kW)@ 40°C ambient	54KW	
	Power factor	0.9	
	Maximum output power (kVA)@ 40°C ambient	60KVA	
	Voltage stability in steady state condition for input (AC & DC)variations and step load (0 to Nominal load) (%)	+/-1%	
	Voltage stability in dynamic condition for input variation (AC & DC) and step load (0 to Nominal load and vice versa)(%)	Complies with IEC/EN 62040-3, Class 1	
	Voltage stability in steady state for100% load imbalance (0,0,100)(%)	± 2%	
	Output voltage distortion with 100% linear load	<1%	
	Output voltage distortion @ reference non linear load as per IEC/EN 62040-3	<3%	
	Short circuit current for 10 ms/ <5s	300 / 150	
	Load crest factor handled without derating the UPS	3:1	

	Phase angle precision with balanced loads (degrees)	< 1	
	Phase angle precision with 100% unbalanced loads (deg.)	<2	
	DC/AC Inverter efficiency %	95	
	Battery/AC Inverter efficiency%	94	
	Neutral conductor sizing	1.7 nominal current	
4	**Battery**		
	Capacity of UPS	60 KVA	
	Backup Time	Min. 1 hour for each UPS at full load	
	Battery	Minimum 96000VAH using 12V VRLA battery of reputed brand like Amara Raja, Exide, Panasonic etc.	
	Online Battery Monitoring	Should be available.	
	Battery Recharge Time (after complete discharge to 100% charge)	Should not exceed 10 Hours	
	Battery Housing	A suitable Cabinet/Rack to mount VRLA type of batteries	
	Rectifier Characteristics	# Charging voltage 2.23V to 2.3V per cell.	
		# Power Factor 0.98	
		# Charging current is to be limited to protect the Batteries.	
		#Discharge monitoring	
		#Boost Charge option	
5	**Static Bypass**		
	Nominal bypass voltage	400V (380V/415V selectable, 3Ph + N)	
	Voltage range	±10 (5 to 15 selectable)	
	Nominal frequency	50Hz (60 selectable)	
	Frequency range	±1 (2, 3, 4 selectable)	
	Static Switch required-Bypass Path	Bypass Path Static Switch-Required Mandatory-Vendor to submit the schematic showing Static switch, If It is not Internal ,Vendor to provide External Static Switch.	
	Static Switch required-Inverter Path	Inverter Path Static Switch-Required Mandatory-Vendor to submit the schematic showing Static switch, If It is not Internal ,Vendor To provide External Static Switch.	
	Maximum overload capacity		
	- for 10 minutes (%)	125	
	- for 1 minutes (%)	150	
	- for 600 milliseconds (%)	700	
	- for 100 milliseconds (%)	1000	
	Transfer time with inverter synchronous to bypass:		

	- Inverter to Bypass (ms)	no break	
	- Bypass to Inverter (ms)	no break	
	Transfer time with inverter not synchronous to bypass (ms)	<20	
6	**System Data**		
	AC/AC efficiency without charging current	94	
	Noise @ 1 meter as per ISO 3746 (dBA±2dBA)	66	
	Protection degree	Minimum IP 20.	
	Galvanic isolation transformer	Inbuilt Factory fitted/external transformer with each UPS System. The system must also enable transformer to be connected at either input or output.	
7	**Environmental**		
	Temperature (°C)		
	- Operating	0-40	
	- Transportation & Storage	0-55	
	Max. relative humidity @ 20°C (non condensing) (%)	Up to 95	
	Max. altitude above sea level without derating (m)	1000 (for higher altitudes complies with IEC/EN 62040-3).	
8	**Certifications**		
	Safety	IEC 62040 - 1	
	EMC Class	EN 50091-2 Class RS	
		IEC 62040 - 2	
	Testing	IEC 62040 - 3	

I hereby certify that the information submitted by me in Form-17 is correct and will be verified to RailTel in Factory Acceptance Test if the order is being placed to my firm. In case of Certifications which are mentioned above, the copy of the certificate issued by the issuing authority mentioning the make and model offered is being submitted for ready reference.

Signature of Authorized Signatory of Contractor"

5. Chapter-7, General Scheme, Design Requirement and Technical Specification (Page 102)

In original tender –

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Annexure-I

TECHNICAL SPECIFICATIONS

Item No.	Description	Clarification
1	**Technology**	Inverter: Online, Double Conversion, IGBT based PWM technology. Converter : IGBT based converter.
2	**Input**	
	Nominal Voltage (in Volt)	400V (3 ph + N)
	Input voltage range without battery discharge(on Full Load)	340V to 460V
	Nominal frequency (in Hz)	50Hz (60 selectable)
	Frequency range	±10%
	Power factor @ nominal load & nominal input conditions(on Full Load)	≥ 0.99
	Input current distortion	≤ 3%
	AC/DC Rectifier efficiency	95
3	**Inverter output**	
	Nominal output voltage	400V (380/415 selectable, 3ph+N)
	Output waveform	Sine wave
	Nominal output frequency (in Hz)	50Hz (60 Selectable)
	Output frequency stability	
	synchronized with bypass mains(%)	±1% (2, 3, 4 selectable)
	synchronized with internal clock	±0.1
	Nominal apparent power @ 40°C ambient (kVA)	60KVA
	Nominal active power (kW)@ 40°C ambient	54KW
	Power factor	0.9
	Maximum output power (kVA)@ 40°C ambient	60 KVA
	Voltage stability in steady state condition for input (AC & DC)variations and step load (0 to Nominal load) (%)	+/-1%
	Voltage stability in dynamic condition for input variation (AC & DC) and step load (0 to Nominal load and vice versa)(%)	Complies with IEC/EN 62040-3, Class 1
	Voltage stability in steady state for100% load imbalance (0,0,100)(%)	± 2%
	Output voltage distortion with 100% linear load	<1%

	Output voltage distortion @ reference non linear load as per IEC/EN 62040-3	<3%
	Short circuit current for 10 ms/ <5s	300 / 150
	Load crest factor handled without derating the UPS	3:1
	Phase angle precision with balanced loads (degrees)	< 1
	Phase angle precision with 100% unbalanced loads (deg.)	<2
	DC/AC Inverter efficiency %	95
	Battery/AC Inverter efficiency%	94
	Neutral conductor sizing	1.7 nominal current
4	**Battery**	
	Capacity of UPS	60 KVA
	Backup Time	Min. 1 hour for each UPS at full load
	Battery	61000VAH using 12V VRLA battery of reputed brand like Amara Raja,Exide,Panasonic etc.
	Online Battery Monitoring	Should be available
	Battery Recharge Time (after complete discharge to 100% charge)	Should not exceed 10 Hours.
	Battery Housing	A suitable Cabinet/Rack to mount VRLA type of batteries.
	Rectifier Characteristics	# Charging voltage 2.23V to 2.3V per cell.
		# Power Factor 0.98
		# Charging current is to be limited to protect the Batteries.
		#Discharge monitoring
		#Boost Charge option
5	**Static Bypass**	
	Nominal bypass voltage	400V (380/415 selectable, 3Ph + N)
	Voltage range	±10 (5 to 15 selectable)
	Nominal frequency	50Hz (60 selectable)
	Frequency range	±1 (2, 3, 4 selectable)
	Static Switch required-Input Path	Input Path Static Switch-Required Mandatory-Vendor to submit the schematic showing Static switch,If It is not Internal ,Vendor To provide External Static Switch.(Delete)
	Static Switch required-Bypass Path	Bypass Path Static Switch-Required Mandatory-Vendor to submit the schematic showing Static switch,If It is not Internal ,Vendor To provide External Static Switch.

	Static Switch required-Battery Path	Battery Path Static Switch-Required Mandatory-Vendor to submit the schematic showing Static switch,If It is not Internal ,Vendor To provide External Static Switch.(Delete)
	Static Switch required-Inverter Path	Inverter Path Static Switch-Required Mandatory-Vendor to submit the schematic showing Static switch,If It is not Internal ,Vendor To provide External Static Switch.
	Maximum overload capacity	
	- for 10 minutes (%)	125
	- for 1 minutes (%)	150
	- for 600 milliseconds (%)	700
	- for 100 milliseconds (%)	1000
	Transfer time with inverter synchronous to bypass:	
	- Inverter to Bypass (ms)	no break
	- Bypass to Inverter (ms)	no break
	Transfer time with inverter not synchronous to bypass (ms)	<20
6	**System Data**	
	AC/AC efficiency without charging current	94
	Noise @ 1 meter as per ISO 3746 (dBA±2dBA)	66
	Protection degree	IP32
	Galvanic isolation transformer	Inbuilt Factory fitted transformer with UPS System. The system must also enable transformer to be connected at either input or output
7	**Environmental**	
	Temperature (°C)	
	- Operating	0-40
	- Transportation & Storage	0-55
	Max. relative humidity @ 20°C (non condensing) (%)	Up to 95
	Max altitude above sea level without derating (m)	1000 (for higher altitudes complies with IEC/EN 62040-3)
8	**Certifications**	
	Safety	IEC 62040 – 1
	EMC Class	EN 50091-2 Class RS
		IEC 62040 – 2
	Testing	IEC 62040 – 3

Should be read as

Annexure-I

TECHNICAL SPECIFICATIONS

Item No.	Description	Clarification
1	**Technology**	Inverter: Online, Double Conversion, IGBT based PWM technology. Converter :IGBT based converter
2	**Input**	
	Nominal Voltage (in Volt)	400V (3 ph + N)
	Input voltage range without battery discharge(on Full Load)	340V to 460V
	Nominal frequency (in Hz)	50Hz (60 selectable)
	Frequency range	±10%
	Power factor @ nominal load & nominal input conditions(on Full Load)	≥ 0.99
	Input current distortion	≤ 3%
	AC/DC Rectifier efficiency	95
3	**Inverter output**	
	Nominal output voltage	400V (380/415 selectable, 3ph+N)
	Output waveform	Sine wave
	Nominal output frequency (in Hz)	50Hz (60 Selectable)
	Output frequency stability	
	synchronized with bypass mains(%)	±1% (2, 3, 4 selectable)
	synchronized with internal clock	±0.1
	Nominal apparent power @ 40°C ambient (kVA)	60KVA
	Nominal active power (kW)@ 40°C ambient	54KW
	Power factor	0.9
	Maximum output power (kVA)@ 40°C ambient	60KVA
	Voltage stability in steady state condition for input (AC & DC)variations and step load (0 to Nominal load) (%)	+/-1%
	Voltage stability in dynamic condition for input variation (AC & DC) and step load (0 to Nominal load and vice versa)(%)	Complies with IEC/EN 62040-3, Class 1
	Voltage stability in steady state for100% load imbalance (0,0,100)(%)	± 2%
	Output voltage distortion with 100% linear load	<1%
	Output voltage distortion @ reference non linear load as per IEC/EN 62040-3	<3%
	Short circuit current for 10 ms/ <5s	300 / 150
	Load crest factor handled without derating the UPS	3:1
	Phase angle precision with balanced loads (degrees)	< 1

	Phase angle precision with 100% unbalanced loads (deg.)	<2
	DC/AC Inverter efficiency %	95
	Battery/AC Inverter efficiency%	94
	Neutral conductor sizing	1.7 nominal current
4	**Battery**	
	Capacity of UPS	60KVA
	Backup Time	Minimum 1 hour for each UPS at full load
	Battery	Minimum 96,000VAH using 12V VRLA battery of reputed brand like Amara Raja,Exide,Panasonic etc.
	Online Battery Monitoring	Should be available
	Battery Recharge Time (after complete discharge to 100% charge)	Should not exceed 10 Hours
	Battery Housing	A suitable Cabinet/Rack to mount VRLA type of batteries
	Rectifier Characteristics	# Charging voltage 2.23V to 2.3V per cell.
		# Power Factor 0.98
		# Charging current is to be limited to protect the Batteries.
		#Discharge monitoring
		#Boost Charge option
5	**Static Bypass**	
	Nominal bypass voltage	400V (380/415 selectable, 3Ph + N)
	Voltage range	±10 (5 to 15 selectable)
	Nominal frequency	50Hz (60 selectable)
	Frequency range	±1 (2, 3, 4 selectable)
	Static Switch required-Bypass Path	Bypass Path Static Switch-Required Mandatory-Vendor to submit the schematic showing Static switch,If It is not Internal ,Vendor To provide External Static Switch.
	Static Switch required-Inverter Path	Inverter Path Static Switch-Required Mandatory-Vendor to submit the schematic showing Static switch,If It is not Internal ,Vendor To provide External Static Switch.
	Maximum overload capacity	
	- for 10 minutes (%)	125
	- for 1 minutes (%)	150
	- for 600 milliseconds (%)	700

	- for 100 milliseconds (%)	1000
	Transfer time with inverter synchronous to bypass:	
	- Inverter to Bypass (ms)	no break
	- Bypass to Inverter (ms)	no break
	Transfer time with inverter not synchronous to bypass (ms)	<20
6	**System Data**	
	AC/AC efficiency without charging current	94
	Noise @ 1 meter as per ISO 3746 (dBA±2dBA)	66
	Protection degree	Minimum IP20
	Galvanic isolation transformer	Inbuilt Factory fitted/external transformer with each UPS System. The system must also enable transformer to be connected at either input or output
7	**Environmental**	
	Temperature (°C)	
	- Operating	0-40
	- Transportation & Storage	0-55
	Max. relative humidity @ 20°C (non	Up to 95
	condensing) (%)	
	Max altitude above sea level without derating (m)	1000 (for higher altitudes complies with IEC/EN 62040-3)
8	**Certifications**	
	Safety	IEC 62040 – 1
	EMC Class	EN 50091-2 Class RS
		IEC 62040 – 2
	Testing	IEC 62040 – 3

D.V.Meena
General Manager/O&N