Corrigendum 6 to NIT NO: AEML/MDB/2018-19/013

Dated: 11/02/2019

The corrigendum 6 to the aforementioned Tender is hereby issued as follows:

Extension of Online Bid Submission Date & Time deadline:-

Description	As per Tender	Extended As
Last date of Bidder's queries	-	18/02/2019 (up to 14:00 Hrs IST)
Online Bid Submission Date & Time	10/01/2019 (up to 16:00 Hrs IST)	25/02/2019 (up to 16:00 Hrs IST)

S.No	Clause No / Page No	Existing Clause	Amended/Added Clause
1	Clause no 3. Page No 22	Bill of Quantity (BOQ)	Bill of Quantity (BOQ) Revised
2	Clause no 1. Page No 6	Scope of Work AEML ("Adani Electricity Mumbai Ltd) envisages to setup RF communication canopy network across its distribution area spanning over 400Sq.kms area, catering to over 2.9 million metering points, 92 receiving stations, 6500 substations, 1.2 lacs streetlights etc. The area in Suburban Mumbai served by AEML is from Bandra to Bhayander on the western side, and Sion to Mankhurd on the eastern Side.	**Amended as:** Scope of Work AEML ("Adani Electricity Mumbai Ltd) envisages to setup RF communication canopy network across its distribution area spanning over 99 Sq.kms areas in East Division, catering to over 7 lakhs metering points. Bid has been split into 2 parts a. SITC of Smart Meters b. SITC of Canopy & NIC Bidder can quote for only option a, only option b or both options a & b.
3	Clause no 3.1 b Page No 8	Bidder or Bidder's sub-contractors shall have agreement/ MoU in place (for the integration of Bidders	**Amended as:** Bidder or Bidder's sub-contractors shall have agreement/ MoU in place (for

		technology) with at least leading 2 manufacturers for Smart Meter products based on the relevant Indian standards.	the integration of Bidders technology) with at least 2 leading manufacturers for Smart Meters based on the relevant Indian standards. Bidder to provide Customer certification for above integration.
4	Clause no 3.1 f Page No 8	It is also incumbent on the bidder to integrate with present and future meter vendors of AEML for incorporation of the communication node in Smart Meters.	**Amended as:** It is also incumbent on the Canopy vendor to integrate with Smart meter vendors of AEML choice. Smart meter vendors shall integrate with Canopy vendor selected by AEML for incorporation of the communication node in Smart Meters. Bidders to submit commitment letter for the same.
5	Annexure I Clause 2 b Page No 41	Bidder shall provide Warranty period of 5 years and AMC of 5 years post the warranty period. The AMC shall be reviewed annually.	**Amended as:** Bidder shall provide Warranty period of 5 years and AMC of 5 years post the warranty period. Bidder shall support up-gradation and replacement of software or hardware to ensure data availability for project period (10 year). The AMC shall be reviewed annually.
6	Single phase Smart meter specifications		**Added as :** Single phase Smart meter specifications.
7	Smart Meter Quantity		**Added as :** The buyer reserves the right to split the order amongst the qualified bidders of Part A.

Bill of Quantity (BOQ)

- **Part A** - SITC of Smart Meters

S.N	Items	UOM	Qty Phase I	*Qty Phase II
A	**Smart Meter**			
1	Three Phase LT CT operated Smart Meters	Nos.	3,600	-
2	Three Phase Whole Current Smart Meters	Nos	2,400	75,000
3	Single Phase Smart Meters	Nos	-	6,25,000
4	Installation of Three Phase LT CT operated Smart Meters	Nos.	3,600	-
5	Installation of Three Phase Whole Current Smart Meters	Nos	2,400	75,000
6	Installation of Single Phase Smart Meters	Nos	-	6,25,000

*Phase II to be completed in a period of 2 years

- **Part B** - SITC of Canopy, NIC

S.N	Items	UOM	Qty Phase I	*Qty Phase II
B	**Canopy & NIC**			
I	**Capex**			
1	RF Communication Canopy Network Elements	Nos.	*	-
2	NIC cards (to be integrated with AEML Smart meter vendors)	Nos.	6,000	7,00,000
3	RF Nodes	Nos.	1,000	-
	Integration with AEML Smart meter vendors (per meter make)	Nos.	1	-
4	Head-end System (HES)	Nos.	50,000	6,75,000
5	Installation of RF Communication Canopy Network Elements	Nos.	*	-
6	Installation of RF Nodes	Nos.	1,000	-
II	**Opex**			
1	FMS for RF Communication Canopy Network	Per point per Year	1	-
2	RF Communication Canopy Network Hardware AMC charges post warranty (5 years)	Per point per year	1	-
3	Software AMC charges of HES (10 years)	Per year	1	-

*Phase II to be completed in a period of 2 years

Earnest Money Deposit (EMD)*/ Bid Security

Earnest Money Deposit (EMD)*/ Bid Security	
Part A (SITC of Smart Meters)	Rs. 1,00,00,000/- (Rupees One Crore only)
Part B (SITC of Canopy, NIC)	Rs. 50,00,000/- (Rupees Fifty Lacs only)
Part A+B (SITC of Smart Meters, Canopy & NIC)	Rs. 1,50,00,000/- (Rupees One Crore Fifty Lacs only)

* Above EMDs shall be submitted in the form of Bank Guarantee and shall be valid up to 180 days from the date of bid submission. (refundable without interest).

SITC – Supply, Installation, Testing and Commissioning

Single phase Smart meter specifications:

Specification

Smart single Phase Smart Meter
(10-60A)

CONTENTS

1.0 SCOPE

This specification covers the design, manufacture testing, supply and delivery of single phase 2 wire 10-60 Amps smart Static Watt hour meters with export and Import modes of class: 1.0 accuracy. All the energies and Demands shall be considered for Export and Import modes along with Absolute (Export + Import) modes

2.0 STANDARDS

IS: 13779, IS 15884 , IS : 15959 ,IS 16444 , IEC 62052, IEC 62053 & CBIP Technical report no.304 and its latest amendments along-with Reliance Energy Limited specifications.

3.0 FUNCTIONAL SPECIFICATION

Sr. No.	Function /Feature	Technical Requirements
3.1	Voltage Ratings	240 volt (P-N), +20% to -40% Vref, however the meter should withstand the maximum system voltage i.e. 440 volts continuously.
3.2	Current Ratings	10-60 amp with 120 % overload capacity
3.3	Starting current	0.2 % of Ib
3.4	Accuracy	Class 1.0 as per IS 13779:1999
3.5	Display	I. LCD (Six digits) with Height: 10 mm X 5 mm min. II. Pin Type connections with viewing angle min. 160 degrees
3.6	Power factor range	Zero lag –unity- zero lead

Sr. No.	Function /Feature	Technical Requirements
3.7	Measured parameters	I. Instantaneous parameters a. Voltage b. Current phase & Neutral channel c. Power factor d. Power in kW & kVA e. RTC f. Frequency g. THD / TDD (Voltage & Current) h. Tamper count i. Billing count j. Programming count II. Energies a. Active energy kWh (Import / Export) b. Apparent energy kVAh (Import / Export) c. Reactive energy kVArh (Lag) III. Maximum Demand a. kW and kVA (Import / Export) b. Integration time 15/30 minutes (Remote programmable) IV. Display parameters and tamper events shall be as per Annexure-1
3.8	Power Consumption	As per IS 16444 excluding Communication & disconnection modules
3.9	Frequency	50 Hz with + / - 5% variation
3.10	Test Output Device	Flashing LED visible from the front for kWh and kVAh/kVArh
3.11	Load Survey data	Load survey for 60 power on days for 15/30 min integration : I. Active energy (Import / Export) II. Apparent energy (Import / Export) III. Average Voltage IV. Average current V. Average Power factor VI. Mid night kWh(Import / Export) ,kVAh(Import / Export), kVArh (Lag)

Sr. No.	Function /Feature	Technical Requirements
3.12	Billing data	I. Meter serial number II. Date and time III. Monthly average power factor IV. Monthly Energies & TOD Energies with 6 month History for a. Active energy kWh (Import / Export) b. Apparent energy kVAh (Import / Export) c. Reactive energy kVArh (Lag) V. Monthly & TOD Maximum Demand with 6 month History along with date & time stamp a. kW(Import / Export) and kVA(Import / Export) b. Integration time 15/30 minutes VI. Total Power ON hours with 6 month History VII. Tamper & Fraud registers with 6 month History for a. Active energy kWh (Import / Export) b. Apparent energy kVAh (Import / Export) c. Reactive energy kVArh (Lag)
3.13	MD Registration	I. Meter shall store MD in every 15/30 min. period along with date & time. At the end of every 15/30 min, new MD shall be previous MD and store whichever is higher and the same shall be displayed. II. It should be possible to reset MD automatically on the defined date (or period) or through MRI or through communication. III. Manual MD reset knob should not be provided / disabled.
3.14	Auto Reset of MD	Auto reset date for MD shall be 1st Day of month at 00.00 Hrs. and provision shall be made to change the same through communication. Meter shall store the Billing data at the time of MD reset

Sr. No.	Function /Feature	Technical Requirements
3.15	TOD metering	Meter shall be capable doing TOD metering of Billing data in 6 time zones (programmable through CMRI / communication)
3.16	Tamper Events data	Meter shall log last 50 events with date and time stamp and snap shots of I. Energies a. Active energy kWh (Import / Export) b. Apparent energy kVAh (Import / Export) c. Reactive energy kVArh (Lag) II. Instantaneous parameters a. Voltage b. Current phase & Neutral channel c. Power factor d. Power in KW The above events to be stored with FIFO basis
3.17	Power Quality Information	Meter shall log last 50 events of a. Power on/off b. Under Voltage c. Over Voltage d. Connection / disconnection e. THD / TDD (Voltage / Current) with date and time stamp and snap shots of I. Cumulative Energies a. Active energy kWh (Import / Export) b. Apparent energy kVAh (Import / Export) c. Reactive energy kVArh (Lag) II. Instantaneous parameters a. Voltage b. Current phase & Neutral channel c. Power factor d. Power in kW III. The above events to be stored with FIFO basis the settings of Over / Under voltage will be decided by Utility

Sr. No.	Function /Feature	Technical Requirements
3.18	Event data management	I. Meter shall generate selective alarms to HES at the instant of occurrence/restoration of event with record in memory. II. Selection of event alarms shall be with CMRI / communication with Authorization.
3.19	Connection disconnection feature	I. Meter shall be equipped with connection /disconnection device in phase & neutral channel comply with IS 15884 II. The status should be logged as event displayed available on display III. The same device shall be operated in following conditions through communication: a. Over Current b. Load control limit (Programmable) c. Selective Tampered condition d. No payment condition (Prepayment mode)
3.20	Function of Connection disconnection device under over current & load control	I. The meter shall try to reconnect three times with 5 minutes interval locally. If the situation persists then try to reconnect after 30 Minutes. II. The parameters listed follows shall be programmable through communication: a. Enable / Disable b. reconnect interval c. Load limit III. The status of Connection disconnection device shall be retained in case of power failures / restoration, to be displayed and made available through communication
3.21	Programmability of meter	I. Programmable facility to restrict the access to the information recorded at different security level such as read communication , communication to write etc II. Facility to change in programmable parameters to come in to effect at later pre-defined date III. Facility to correct RTC from communication shall be provided

Sr. No.	Function /Feature	Technical Requirements
3.22	Memory	Non volatile memory independent of battery backup, Data should be retained up to 10 years
3.23	Software & communication compatibility	a) Optical port with RS 232 compatible to transfer the data locally b) The Supplier shall supply Software required for CMRI & for the connectivity to COMMUNICATION MODULE modules. The supplier shall also provide training for the use of software. The software should be compatible to latest version of Microsoft Windows systems The software should have polling feature with optional selection of parameters to be downloaded for AMR application. c) Necessary provision shall be made in the software for converting all the parameters available for new and old meters if supplied earlier. Copy of operation manual shall be supplied. d) The reading protocol should be of open category (ie. DLMS (IS 15959) and details to be shared with utility.
3.24	Climatic conditions	As per IS: 13779 for climatic conditions.
3.25	Calibration	Meters shall be calibrated at factory and modification in calibration shall not be possible at site by any means. Certified by manufacturer.

Sr. No.	Function /Feature	Technical Requirements
3.26	Communication module interface	Meter should have the provision for interfacing the removable communication module. The suggested pin out of the interface are Pin1 : Rx (RS232 level) Pin2: Tx (RS232 level) Pin3: GND Pin4: Handshake signal if any by the Meter Pin5: DC voltage(5V @2.5W) Pin6: Cry-out alarm interrupt 3.3 or 5V The suggested connector is 2x3 Pin connectors. The Meter should have a suitable slot/receptacle for fixing the removable communication module. The maximum dimension for the slot to be 130mmx70mmx35mm

4.0 CONSTRUCTIONAL SPECIFICATIONS

Sr. No.	Parameters	Technical Requirements

Sr. No.	Parameters	Technical Requirements
4.1	Body of Meter	a) Top transparent and base opaque material polycarbonate of LEXAN 143A/943AA or equivalent grade. b) Front cover & base should be ultrasonically welded with IP51 grade enclosure. c) Top cover should be designed so as the internal components should not be visible. d) The communication module slot should be preferably front accessing either on top or near the terminal cover with sealable door. However the manufacturer can provide any suitable alternative means for interfacing the removable communication module. e) The base of the slot accommodating the communication module should be shielded. f) The colour of the body shall be as per approved colour from Reliance brand management
4.2	Terminal Block	Made of polycarbonate of grade 500 R or equivalent grade and shall form Integral part of the meter base, brass or copper current terminals with flat-head brass screws. All the components should be duly plated.
4.3	Terminal cover	Transparent terminal cover with provision of sealing through sealing screw.
4.4	Diagram of connections	Diagram of external connections to be shown on terminal cover
4.5	Marking on name plates	Meter should have clearly visible, indelible and distinctly name plate marked in accordance with IS & Reliance Energy Ltd specifications.
4.6	Meter Sealing	Supplier shall affix one Buyer seal on side of Meter body as advised and record should be forwarded to Buyer.
4.7	Guarantee	5 Years.
4.8	Insulation	A meter shall withstand an insulation test of 4 KV and impulse test at 8 KV

Sr. No.	Parameters	Technical Requirements
4.9	Resistance of heat and fire	The terminal block and Meter case shall have safety against the spread of fire. They shall not be ignited by thermal overload of live parts in contact with them as per the relevant IS 13779.

5.0 TAMPER & ANTI-FRAUD DETECTION/EVIDENCE FEATURES

5.1 Tamper Conditions:

The meter shall not get affected by any remote control device & shall continue recording energy under any one or combinations of the following conditions:

Sr. No.	Tamper condition	Meter behavior	Limits of errors
5.1.1	I/C & O/G Interchanged	Meter should record forward energy	-/+ 1%
5.1.2	Phase & Neutral Interchanged	Meter should record forward energy	-/+ 1%
5.1.3	I/C Neutral Disconnected, O/G Neutral & Load Connected To Earth.	Meter should record forward energy	-/+ 1%
5.1.4	I/C Neutral connected, O/G Neutral Connected To Earth Through Resistor & Load Connected To Earth.	Meter should record forward energy	-/+ 1%
5.1.5	I/C (Phase & Neutral) Interchanged, Load Connected To Earth.	Meter should record forward energy	-/+ 1%

5.1.6	I/C & O/G (Phase or Neutral) Disconnected, Load Connected To Earth.	Meter should record forward energy	-/+ 2%
5.1.7	External magnet tamper greater than 0.2 Tesla (AC /DC)	Meter should record as per the Imax rating and log the event	N.A.
5.1.8	Meter cover opened	Meter should log the event	N.A.
5.1.9	External Electrostatic discharge (commonly named as 35 KV tamper)	Meter should record forward energy	-/+ 1%

The meter should be with the **visual indications** as per **Annexure I** for tamper conditions and should log the latest events in the memory with date and time stamp with electrical parameter snapshots. The total number of events (occurrence and restore) will be at least 200 nos. The persistence time & threshold parameters shall be informed at the time of technical discussion. The total number of events should be categorized under following types :

1. Reverse power
2. Earthed load
3. Neutral Cut
4. External Magnet
5. Cover open
6. ESD tamper

5.2 Tamper Energy registers:

The meter shall record energy in separate registers (Defraud) for following conditions along with cumulative registers:

1. Neutral Cut
2. External Magnet

5.3 Influence Parameters

The meter shall work satisfactorily with guaranteed accuracy limit under the presence of the following influence quantities as per IS13779 , IEC: 1036 and CBIP Technical Report No: 88 with latest amendment:

a) External magnetic field – 0.2 Tesla AC or DC
b) Electromagnetic field induction,
c) Radio frequency interference,
d) Vibration etc,

e) Waveform 10% of 3rd harmonics,
f) Voltage variation,
g) Frequency variation
h) Electro magnetic H.F. Field,
i) D.C. immunity test,(Both phase and neutral circuits)

6.0 GENERAL REQUIREMENTS

6.1 On the meter name-plate:

a) meter serial number should be of at least 7 digits

b) Size of the digit of the meter serial number should be minimum 5mm X 3mm.

c) bar code should be printed next to / below / above the meter serial number

6.2 BIS registration mark (ISI mark)Supplier shall supply software suitable for energy measurement & energy spot billing through CMRI.

6.3 The supplier should seal meters with own seals with their logo and sr. no. The record to be maintained and to be forwarded to buyer with dispatch test results in REL format . As per present regulations lead seals are not allowed in India.

6.4 The supplier should fix seals on both sides of meters provided by buyer. The record to be maintained and to be forwarded to buyer with dispatch test results in REL format . The Buyer shall approve the method of sealing.

6.5 The internal potential links should be in closed position or link less Meters will be preferred and there shall not be any external link.

6.6 Terminal cover should be fixed on Meter before dispatch.

6.7 Meter Sr. Nos. to be printed in black on the name plate, instead of embossing.

6.8 Box number, Meter serial number, type, rating should be mentioned on cases / cartons.

6.9 Meters shall be suitably packed with environmental friendly material in order to avoid damage or disturbance during transit or handling and to prevent in grace of moisture and dust.

6.10 Meters shall be supplied along with optical port chords suitable to read meters @ one unit per 50 meters

7.0 Annexure-1

7.1 The meter shall have **LED** i.e. Cal Pulse LED of RED color in front display of meter.
7.2 Tamper Indications: To be displayed on LCD display as listed below

7.2.1 Represented in Symbols

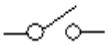
1) Magnet

2) Reverse

3) Earth Load

4) RTC Fail

5) Connect / Disconnect status



a) Represented in Words

1) Cover Open
2) Other abnormal events (eg. ESD, NVM fail etc)
3) Error Codes
4) Single wire/Neutral Cut

7.3 Display Parameter Sequence

a) Auto Mode (Default Display)

Import Total KWh (Import total KWh to be displayed continuously without decimal)

Note: In case of occurrence of meter "Cover Open" tamper, the message "Cover Open" and Import Total KWh shall be displayed in toggle mode (6 seconds).

b) On Demand Display

After using the pushbutton the following parameters should be displayed;

1) LCD Test
2) RTC Date
3) RTC Time
4) Current MD KW
5) Current MD KVA

6) Current MD in KW occurrence date and time
7) Current MD in KVA occurrence date and time
8) Last month billing date
9) Last month billing KWh reading (H1)
10) Last month billing MD in KW (H1)
11) Last month billing MD in KVA (H1)
12) Last month billing MD KW occurrence date and time (H1)
13) Last month billing MD KVA occurrence date and time (H1)
14) Instantaneous Voltage
15) Instantaneous Phase Current
16) Instantaneous Neutral Current
17) Power Factor
18) High Resolution Cumulative Total KWh for dial test.(00.0000 format)
19) Previous month billing KWh reading (H2)
20) Previous month billing MD in KW (H2)
21) Previous month billing MD occurrence date and time (H2)
22) Previous month billing KWh reading (H3)
23) Previous month billing MD in KW (H3)
24) Previous month billing MD occurrence date and time (H3)
25) Previous month billing KWh reading (H4)
26) Previous month billing MD in KW (H4)
27) Previous month billing MD occurrence date and time (H4)
28) Previous month billing KWh reading (H5)
29) Previous month billing MD in KW (H5)
30) Previous month billing MD occurrence date and time (H5)
31) Previous month billing KWh reading (H6)
32) Previous month billing MD in KW (H6)
33) Previous month billing MD occurrence date and time (H6)

Note: The meter display should return to Default Display mode (mentioned above) if the 'push button' is not operated for more than 6 seconds.

7.4 TOD zone timings:

T1 - 06.00 to 09.00 Hrs.

T2 – 09.00 to 12.00 Hrs

T3 – 12.00 to 18.00 Hrs.

T4 – 18.00 to 22.00 Hrs.

T5 – 22.00 to 06.00 Hrs.