POWER GRID COMPANY OF BANGLADESH LIMITED

BIDDING DOCUMENT

FOR

Design, Supply, Erection, Testing & Commissioning and Integration with NLDC of 13 nos of new Grid Sub-Stations on Turnkey Basis.

Volume 3 of 3

POWER GRID COMPANY OF BANGLADESH LIMITED

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Volume 3 of 3

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SCHEDULE A

INTRODUCTION & PREAMBLE TO THE PRICE & TECHNICAL SCHEDULES

BRIEF DESCRIPTION OF THE WORKS

The bidder shall be deemed to have visited site, inspected, gathered data and verified details of the as-built system in order to design, supply and interface their new equipment. All necessary materials, adjustments, dismantling, remedial and tiding-up work in order to complete the work specified shall be included in the contract price. **The contractor is responsible for ensuring that all and/or and any item(s) of work required for the safe, efficient and satisfactory completion and functioning of the works, are included in the Bid Price whether they are described in the specification or not.**

The scope of work comprises the following: -

DESCRIPTION OF WORKS

The scope of work under this turnkey Bid is design, supply, delivery, installation, testing & commissioning and integration with NLDC(Main and backup station)of Telecom and SCADA equipment at 13 Grid Substations on Turnkey basis.

All required electrical quantities digital and analog shall be transmitted to the NLDC through the SDH/PDH from Sub-Stations, Integrated database and tested.

All analog data and digital data of HV breakers, tap changer, Isolators, etc. shall be monitored from NLDC through the RTU and SDH/PDH using IEC 60870-104 protocol. Necessary cabling and interfacing between the Sub-Station and the RTU and the communication equipment are to be included in this contract.

Necessary modification in the software and hardware at NLDC master station and back up station at Biddyut Bhaban is also to be done under this contract to accommodate all the new system extended under this contract if necessary including the following:

- Modeling of RTU and communication model in the NLDC software. Creation of associate display and modification of existing displays wherever required.
- Performing point to point test to verify the data.
- Modeling of electrical network associated with the new RTUs/SAS to be included, parameterization of various power system devices like lines, transformers, units etc. at the NLDC software.
- Tuning of EMS applications at NLDC to be carried out.
- Updating of the DTS with the new network model.

Sub-Station Wise Required Main Equipment Details

Sl. No.	Name of Grid S/S	Telecom Equipment	RTU& MC	48v Charger	48v Battery
1	Savar	-	1	-	-
2	Munshigonj	-	1	-	-
3	Daudkandi	-	1	-	-
4	New Tongi	1	1	-	2
5	Sonargaon	-	1	-	-
6	B. Baria	-	1	-	-
7	Panchagar	1	1	2	2
8	Joypurhat	1	1	2	2
9	Niamatpur	1	-	-	-
10	Chuadanga	1	1	2	2
11	Magura	1	1	2	2
12	Gallamari GIS	1	-	2	2
13	GK Project 132kv	1	1	2	2
Total		8 Lots	11 Lots	12 Sets	14 Sets

Inspection:

The Contract Price shall include all costs of inspection of Employers engineer for the following:

(a) Six(6) engineers nominated by the Employer shall participate in the inspection and witnessing of factory acceptance tests at manufacturers' works for RTUs, for Communication equipment and Battery & Battery Chargers (3 trips), each visit to be attended by two engineer of at least seven (7) days duration each.

The Contractor shall be responsible for bearing all costs for witnessing factory acceptance, including air fares, accommodation, meal, healthcare, transportation, visa fees etc. together with payment of a daily allowance of US$ 150 for each of the Employer's engineer.

SCHEDULE A

REQUIREMENTS

Item	Description
1	Remote Terminal Unite (RTU) Remote Terminal Unite (RTU) as per SLD with 20% spares capacity. RTU acquisition protocol –MOD Bus, Communication protocol IEC-60870-5-104 and communication parameter & signal list to be approved by PGCB. Supply of Sub-Stations SCADA adaptation materials (i.e. Transducer/MFT, Cables for CT/PT/control/signaling etc, GPS,MC/SIC, Multiplying relay and so on) also included.
2	Fiber Optic Telecommunication Equipment (SDH/PDH) for each Lot with following services: a) Voice Communication b) Data Communication (Both LAN & WAN), c) Tele-protection d) Different LAN services (CCTV, DFDR etc for central monitoring)
3	Integration of RTU and Telecom equipment to Master & Back Up Station's SCADA EMS and Telecom NMS system.
4	48 Volt DC Battery, 100Ahr, Nickel -Cadmium
5	50 A, Charger for 48 Volt DC 100Ahr battery.

APPENDIX A1

SCHEDULE OF TECHNICAL REQUIREMENTS OF NI-CAD BATTERY

SL. No.	Description	
1.	Installation	: Indoor
2.	Cell Type	: Ni-cd
3.	Voltage (Normal)	: 1.2 volts per cell
4.	Float voltage	: 1.40-1.42 volt/cell
5.	Equalizing voltage	: 1.55-1.65 volt/cell
6.	Capacity in AH at 20^0C	: 100AH @ 5 Hr
7.	Ambient temperature	: 45^0C
8.	Positive plate	: Tubular
9.	Negative plate	: Pasted
10.	Types of containers	: Plastic polymer
11.	Discharge voltage	: 1.0 V/Cell
12.	Sp. Gravity of electrolyte	: 1.19 ± 1%
13.	Sp. Gravity of electrolyte (Charged)	: 1.23 ± .010 at 20^0C
14.	Vent plug	: Anti corrosive & fire proof
15.	Cell condition	: Pre-charged
16.	Battery stand	: Steel frame of step type
17.	Standard	: IEC or equivalent

APPENDIX A2

SCHEDULE OF TECHNICAL REQUIREMENTS OF 48 V BATERY CHARGER

SL. No.	Description	
	A) GENERAL	
1.	Installation	:Indoor
2.	Rectifier type	:Thyristor controlled.
3.	Rated D.C. voltage	:48V ±5%
4.	Rated output current	:50Amps (capacity shall be confirmed by calculation during executionand load shall be considered during boost charging)
5.	Charging mode	: Both constant current & constant voltage
6.	High Voltage Insulation	: 1000 V AC for 1 minute between input to output and input to ground
7.	Insulation resistance	:10 MΩ with 500V DC for 1minute
8.	Cooling system	:Self & natural air cooled.
9.	Relative humidity	:Upto 98%
10.	Ambient temperature	:45°C (max.)
11.	Noise level	:65 dB (max)
12.	Altitude	: 1000 m
13.	Applicable Standard	:IEC or equivalent.
	B) TECHNICAL DATA	
	A.C. INPUT	
1.	Voltage	:415 Volts
2.	Phase	:3 Phase
3.	Frequency	:50±5% Hz
4.	Input AC voltage variation	:±5%
5.	Power factor (Full range)	: 0.8
6.	Efficiency (Full load)	:85%
7.	Charge Characteristics	: Constant current /Constant voltage (During float charge)
8.	Current limitation	:110%
	D.C. OUTPUT	
1.	Voltage	:48±5% volt
2.	Ripple Voltage (Full load)	:±3%
3.	Charge modes (3 level)	:Charge, Float charge& Boost charge
4.	Float Voltage (adjustable)	:1.42 volt/cell
5.	Boost Voltage (adjustable)	:1.53 volt/cell

APPENDIX A3

SCHEDULE OF TECHNICAL REQUIREMENTS OF FIBRE OPTIC MULTIPLEXER EQUIPMENT

SL.No.	DESCRIPTION	UNIT	REQUIRED
1.0	**GENERAL:**		
1.1	Type of multiplexer		SDH: ADM
1.2	Complying to ITU-T rec.		Yes
1.3	Transmission Capacity	Mbit/s	STM-1: 155
1.4	Access capacity on 64 kbit/s	channels	Minimum 200
1.5	Access capacity on 2 Mbit/s	channels	Minimum 40
1.6	Redundant central processor		Shall be available
1.7	Digital cross connect function		Fully non-blocking
2.0	**Available AGGREGATES:**		
2.1	Optical aggregates (ITU-T G.957)		L-1.1, L-1.2
3.0	**Available TRUNK INTERFACES:**		
3.1	HDB3, 2 Mbit/s interfaces per module	No.	Minimum 8
3.2	Complying to ITU-T rec.		G.703, transparent G.704, selectable
3.3	HDSL, 2Mbit/s interface: no of copper wires Capacity on 2Mbit/s or on 1Mbit/s Capacity selectable	No. ch ch / pair of wire	4 or 2 30 or 15 30 / 2 pairs 30 / 1 pair 15 / 1 pair
4.0	**Available USER INTERFACES**		
4.1	**Voice interfaces for trunk lines:**		
4.1.1	1 + 1 com path protection, available for all		yes
4.1.2	Analogue, 4wire with E&M: Input level Output level	dBr	+7.5 .. –16 +7.0 .. –16.5
4.1.3	Analogue, 2wire with E&M: Input level Output level	dBr	+6.5 .. –12.5 –1.0 .. -20
4.1.4	Digital, 2Mbit/s CAS or PRI		yes
4.2	**Voice interfaces for remote subscriber:**		
4.2.1	2wire, subscriber side	dBr	-5 .. +4 / -7.5 .. -1
4.2.2	2wire, PABX side	dBr	-5 .. +4 / -7.5 .. -3
4.3	**Integrated teleprotection**		
4.3.1	**Interface for Commands:**		
4.3.1.1	Number of independent commands	No.	4
4.3.1.2	Transmission time max.	ms	6
4.3.1.3	Signal voltage	Vpeak	250
4.3.1.4	1 + 1 com path protection		yes
4.3.2	**Interface(s) for Differential Protection:**		
4.3.2.1	Electrical interface: G.703	kbit/s	64
4.3.2.2	Optical Interface	kbit/s	Minimum 64
4.4	**Data: channels per module**		
4.4.1	1 + 1 com path protection, available for all		yes

4.4.2	V.24/V.28 (RS-232): up to 38.4kbit/s	No.	4
4.4.3	V.11/X.24 (RS-422): 64kbit/s	No.	4
4.4.4	V.35: 64kbit/s	No.	4
4.4.5	V.36 (RS-449): 64kbit/s	No.	2
4.4.6	G.703: 64kbit/s	No.	8
4.4.7	Ethernet: 10/100 BaseT WAN capacity Protocols	No. Mbit/s	1 Min: 2x 2Mbit/s Min.: IP
4.5	**Integrated alarm gathering module:**		
4.5.1	Number of external alarms per module	No.	Min. 20
4.5.2	Auxiliary power supply for ext. contacts		Yes
4.6	**Network Management System**		
4.6.1	Type/Name of configuration tool		
4.6.2	For fault / configuration management		Yes / yes
4.6.3	For local / remote operation		Yes / yes
4.6.4	Data communication network (DCN)		Ethernet / IP or Ethernit / OSI
4.7	**Ambient Conditions:**		
4.7.1	Storage: ETS 300 019-1-1, class 1.2	°C / % hum	-25 .. + 55 / class 1.2
4.7.2	Transport: ETS 300 019-1-2, class 2.2	°C / % hum	-25 .. + 70 / class 2.2
4.7.3	Operation: ETS 300 019-1-3, class 3.1E	°C / % hum	-5 .. +45 / class 3.1E
4.8	**Power Supply**		
4.8.1	Operation	VDC	48 / 60 (-15/+20%)
4.8.2	Fully redundant power supply		yes

DESIGN,SUPPLY,ERECTION,TESTING AND COMISSIONING AND INTEGRATION WITH NLDC OF 13 NOS NEW GRID SUB-STATIONS ON TRUNKEY BASIS.

SCHEDULE B1: SUMMARY OF PRICE SCHEDULE

Foreign Currency Price:

Description of Works		Foreign Currency Prices							
		Outside Employer's Country						Within the Employer's Country	Total F/C Cost
		Total Price FOB	Insurance	Freight	Total CIF Price	Erection	Total Amount	Total Price EXW	
1		2	3	4	5=(2+3+4)	6	7=(5+6)	8	9=(7+8)
Supply of Goods Schedule B2	Outside Employer's Country								
	Within the Employer's Country								
Inspection & Integration Schedule B3	Outside Employer's Country								
	Within the Employer's Country								
SUBTOTAL AMOUNT (USD)	Outside Employer's Country								
	Within the Employer's Country								
TOTAL AMOUNT (USD)									

Local Currency Price:

Description of Works	Local Currency Prices in Bangladesh Taka							
	Within the Employer's Country				Outside Employer's Country			Total L/C Cost
	Total Price EXW	Transportation & Handling to destination plus Erection (LTE)	Insurance to Destination	Total Amount	Local Transportation & Handaling Cost	Local Insurance to Destination	Erection & Design	
1	2	3	4	5=(2+3+4)	6	7	8	9=(6+7+8)
Supply of Goods Schedule B2								
Inspection & Integration Schedule B3								
TOTAL AMOUNT (Bangladesh Taka)								

TOTAL CONTRACT PRICE in words ..... plus Bangladesh Taka .....

The above price shall appear on the FORM OF PRICE BID

Note: Income Tax will be deducted from the Contractor's invoices at the time of payment, according to the Income Tax Rules and Regulations of Bangladesh, Present Income Rule (TDS) is seven point five percent (7.5%).

DESIGN, SUPPLY, ERECTION, TESTING & COMMISSIONING AND INTEGRATION
WITH NLDC OF 13 NEW GRID SUBSTATIONS ON TRUNKEY BASIS
SCHEDULE B2-1:Price for itemized works,Goods, or Services outside of Employer's country

					Foreign currency (F/C) Price (in ……..)							Local currency (L/C) Price (in Taka)			
Item	Description	Unit	Qty.	Country of origin	Unit price FOB	Total price FOB	Insurance	Freight	Total Price CIF	Erection cost	Total F/C cost	Local transport & handling cost to destination	Local Insurance to destination	Erection cost	Total L/C cost
			1		2	3=1x2	4	5	6=3+4+5	7	8=6+7	9	10	11	12=9+10+11
1	Remote Terminal Unite (RTU) as per SLD with 20% spares capacity. RTU acquisition protocol –MOD Bus, Communication protocol IEC-60870-5-104 and communication parameter & signal list to be approved by PGCB. Supply of Sub-Stations SCADA adaptation materials (i.e. Transducer/MFT, Cables for CT/PT/control/signaling etc, GPS,MC/SIC, Multiplying relay and so on) also included.	Lot	11												
2	Fiber Optic Telecomm Equipment (SDH/PDH) for each Lot with following services: a) Voice Communication b) Data Communication (Both LAN & WAN), c) Tele-protection d) Different LAN services (CCTV, DFDR etc for central monitoring)	Lot	8												
3	48 Volt DC Battery, 100Ahr, Alkaline.	Set	14												
4	50 A, Charger for 48 Volt DC 100Ahr battery.	Set	12												
5	Auxiliary Relays	Lum sum													
	Total														

Note: Income Tax will be deducted from the Contractor's invoices at the time of payment, according to the Income Tax Rules and Regulations of Bangladesh, Present Income Rule (TDS) is seven point five percent (7.5%).

DESIGN, SUPPLY, ERECTION, TESTING & COMMISSIONING AND INTEGRATION
WITH NLDC OF 13 NEW GRID SUBSTATIONS ON TRUNKEY BASIS
SCHEDULE B2-2:Price for itemized works,Goods, or Services inside of Employer's country

				Foreign Currency (in.....)		Local Currency (in BDT)		
Item	Description	Unit	Qty.	EXW Unit Price	EXW Total Price	EXW Unit Price	EXW Total Price	VAT on EXW
			1	2	3=1x2	4	5=1x4	6
1	Remote Terminal Unite (RTU) as per SLD with 20% spares capacity. RTU acquisition protocol –MOD Bus, Communication protocol IEC-60870-5-104 and communication parameter & signal list to be approved by PGCB. Supply of Sub-Stations SCADA adaptation materials (i.e. Transducer/MFT, Cables for CT/PT/control/signaling etc, GPS,MC/SIC, Multiplying relay and so on) also included.	Lot	11					
2	Fiber Optic Telecomm Equipment (SDH/PDH) for each Lot with following services: a) Voice Communication b) Data Communication (Both LAN & WAN), c) Tele-protection d) Different LAN services (CCTV, DFDR etc for central monitoring)	Lot	8					
3	48 Volt DC Battery, 100Ahr, Alkaline.	Set	14					
4	50 A, Charger for 48 Volt DC 100Ahr battery.	Set	12					
5	Auxiliary Relays	Lum sum						
6	LVAC, Control Cables, Signal Cables	Lum sum						
7	Civil works for installation of panels and extension of cable trench (If needed)	Lum sum						
	Total							

Note: Income Tax will be deducted from the Contractor's invoices at the time of payment, according to the Income Tax Rules and Regulations of Bangladesh, Present Income Rule (TDS) is seven point five percent (7.5%).

DESIGN,SUPPLY,ERECTION,TESTING AND COMISSIONING AND INTEGRATION WITH NLDC OF 13 NOS NEW GRID SUB-STATIONS ON TRUNKEY BASIS

Schedule B3 : Inspection & Intregation

				Foreign Currency (F/C) Price (in .....)		Local Currency (L/C) Price (in Taka)	
Item	Description	Unit	Qty	Outside Employer's Country		Within Employer's Country	
				Unit Price	Total F/C Cost	Unit Price	Total L/C Cost
			1	2	3=1x2	4	5=1x4
B3-1	Inspection Cost		LS				
B3-2	Integration of RTU and Telecom equipment to Master & Back Up Station's SCADA EMS and Telecom NMS system.		13				
Sub-Total Price carried forward							

Sub Total Price in words.....

Schedule B: Bid Price

Note: Income Tax will be deducted from the Contractor's invoices at the time of payment, according to the Income Tax Rules and Regulations of Bangladesh, Present Income Rule (TDS) is seven point five percent (7.5%).

Note2: The cost of NLDC SCADA integration shell be as per attached contract price between ALSTOM T&D and Power Grid Company of Bangladesh Ltd.

CONTRACT DOCUMENT

Contract Agreement for
NLDC SCADA Integration –
Unit Price Fixation Agreement

Between

POWER GRID COMPANY OF BANGLADESH LIMITED

&

ALSTOM T&D INDIA LIMITED



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NLDC SCADA Integration - Unit Price Fixation Agreement

This agreement made on this the 25th May 2016 between Power Grid Company of Bangladesh Ltd., IEB Bhaban (New), 3rd& 4th Floor, Ramna, Dhaka, Bangladesh (hereinafter called "the Employer") of the one part and ALSTOM T&D India Ltd, A-7, Sector-65, Noida-201301, U.P., India (hereinafter called "the Contractor") of the other part.

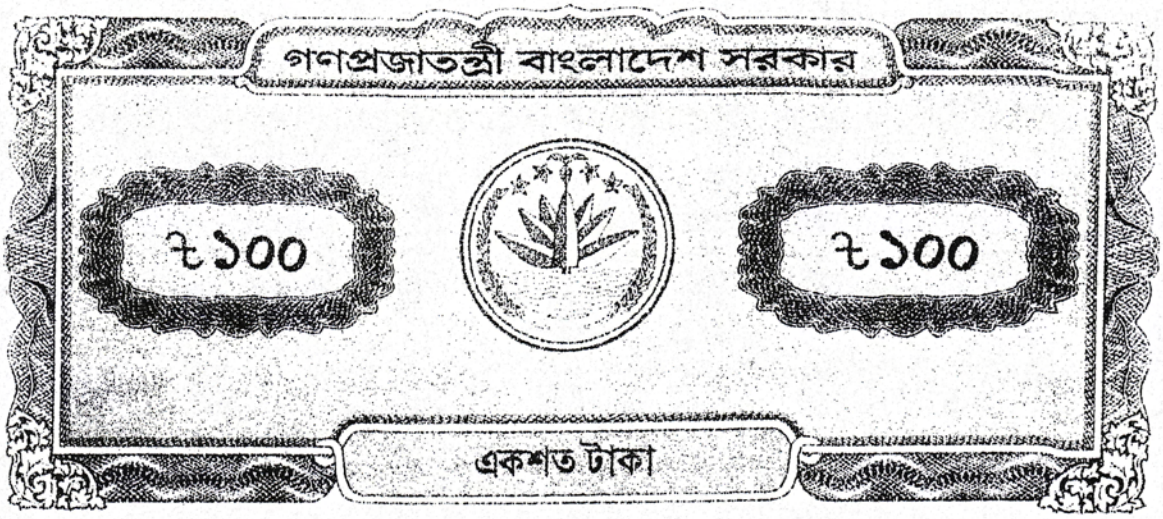
Whereas the employer desires that the works known as "SCADA integration both in main & backup control center for new power station, substation, line bay, transformer bay, generator bay" to be executed by the contractor, and has accepted an offer by the contractor for the execution and completion of following works as per below details:

Sl No	Work Description	Unit	Qty.	Unit Price EURO + BDT	Total Price EURO + BDT
1	Integration of New RTU/SAS at Control Center (as per technical specs)	Substation	1	Euro 28,500.00 + BDT 15,00,000.00	Euro 28,500.00 + BDT 15,00,000.00
2	Integration of New Power Plant at Control Center (as per the technical specs)	Power Station	1	Euro 28,500.00 + BDT 15,00,000.00	Euro 28,500.00 + BDT 15,00,000.00
3	Integration of New Line Bay /Transformer /Generator of existing station at Control Center. The same price shall be applicable for integration of 2 bays of the same station.	Bays	1-2	Euro 10,000.00 + BDT 10,00,000.00	Euro 10,000.00 + BDT 10,00,000.00
4	Integration of New Line Bay /Transformer /Generator of existing station at Control Center - 3 & 4 bays (in the same station)	Bays	3-4	Euro 20,000.00 + BDT 15,00,000.00	Euro 20,000.00 + BDT 15,00,000.00

Employer (PGCB) and the Contractor (ALSTOM T&D India Ltd.) agree as follows:

a. RTU/SAS supplier has to provide inter-operable data till main & backup control center as per NLDC philosophy.

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b. All SCADA database development, power system database modeling and EMS tuning shall be covered by ALSTOM.

c. No hardware shall be in ALSTOM scope.

d. Data validation at main control center with field data.

e. Existing data license of NLDC SCADA system shall be utilized for this purpose.

f. Integration price is valid for the bids which will be invited within December 2017.

g. Above price shall be applicable for a single order for new bays integration in existing substation.

h. In case more than 4 new bays/transformer/generator need to be integrated to existing substation, price of new substation integration (Point No. 1/2) shall be applicable.

i. The above prices are exclusive of all local VAT & TAX.

j. This price will be applicable for all the integration works to NLDC Bangladesh under PGCB or owner of any power plant /Grid sub-station or Nominated EPC Contractors.

k. This price will be applicable for all the projects which are in pipeline and on-going which will be integrate in near future to NLDC.

The following documents shall deem to form and be read and construed as part of this Agreement:

a. Power Of Attorney for Signatory of the Contract

b. Letter of Intent (LOI)

c. Acceptance of Letter of Intent (LOI)

d. Technical Scope of Works

The Governing law shall be the law of Bangladesh

Continued to page 3



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In Witness whereof the parties hereto have caused this Agreement to be executed the day and year first above written.

Authorized Signature of the Contractor:

1 .....

Harneet Kanwar
Senior Manager - Sales
ALSTOM T&D India Ltd.

In the Presence of:

1. .....

Ferdous Khalid
Assistant Project Manager,
ALSTOM T&D India Ltd.,
Dhaka, Bangladesh.

2 .....

Mohammed Fahim Rasekh
Manager, Telecom
ALSTOM T&D India Ltd.,
Dhaka, Bangladesh.

Authorized Signature of the Employer.

1 25/5/2016

Md. Ashraf Hossain
Company Secretary.
Power Grid Company of Bangladesh Ltd.

1. 25/5/16

Jamil Ahmed
Superintending Engineer,
Design & Quality Control
Power Grid Company of Bangladesh Ltd.

2 25-5-16

Md. Rafiqul Islam
Superintending Engineer,
Communication Circle,
Power Grid Company of Bangladesh Ltd.

INDIA NON JUDICIAL

Government of National Capital Territory of Delhi

e-Stamp

सत्यमेव जयते

Certificate No.	:	**IN-DL475609758972820**
Certificate Issued Date	:	10-May-2016 02:58 PM
Account Reference	:	IMPACC (IV)/ dl860303/ DELHI/ DL-DLH
Unique Doc. Reference	:	SUBIN-DLDL860303942851882712010
Purchased by	:	ALSTOM T AND D INDIA LTD
Description of Document	:	Article Others
Property Description	:	Not Applicable
Consideration Price (Rs.)	:	0 (Zero)
First Party	:	ALSTOM T AND D INDIA LTD
Second Party	:	Not Applicable
Stamp Duty Paid By	:	ALSTOM T AND D INDIA LTD
Stamp Duty Amount(Rs.)	:	100 (One Hundred only)

THE SEAL OF NOTARY PUBLIC ... RAJESH CHAND ... NOTARIAL

THE SEAL OF NOTA...

.....Please write or type below this line.....

SPECIAL POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS THAT I, Rathindra Nath BASU, Managing Director, Alstom T&D India Limited, a Company incorporated under the Companies Act, 1956 and having its registered office at A-18, First Floor, Okhla Industrial Area, Phase II, New Delhi- 110020 (hereinafter referred to as the "Company") have been authorized vide the Power of Attorney dated 18 February, 2012 issued pursuant to the resolution of the Board of Directors passed in the Board meeting held on 12 February, 2012, inter alia to execute contracts in the name of and for and on behalf of the Company.

19 MAY 2016

Statutory Alert:

1. The authenticity of this Stamp Certificate should be verified at "www.shcilestamp.com". Any discrepancy in the details on this Certificate and as available on the website renders it invalid.
2. The onus of checking the legitimacy is on the users of the certificate.
3. In case of any discrepancy please inform the Competent Authority

WHEREAS I consider it necessary and expedient for the smooth running and operation of the **Memo no. : 1/PGCB/SE(Com)/1510 dtd. 13/03/2016 of Letter of Intent (LOI) for fixation of SCADA integration both in main & backup control center for new power station, substation, line bay, transformer bay, generator bay.** with **Power Grid Company of Bangladesh Ltd.** (hereinafter called the "Owner"), having its office at **Institution of Engineers Bangladesh (IEB) Bhabon (New), 3rd & 4th Floor, Ramna, Dhaka- 1000** ("Customer") to authorize **Mr. Arun Choudhary, Regional Managing Director-NMS and/or Mr. Rohit Poddar, DGM-Commercial, NMS Sales and/or Mr. Harneet Kanwar, Senior Manager- Sales**; of the Company to severally do all or any of the following acts::

1. To submit and sign contract documents of **Memo no. : 1/PGCB/SE(Com)/1510 dtd. 13/03/2016** on behalf of the Company and to sign applications deeds/instruments in relation thereto.
2. To sign any running/final bills, measurement books and to collect payments from Customer, to acknowledge and confirm any bills and deviation statements, to receive materials from the Customer for execution of the above mentioned contract.
3. To do any other act or submit any document related to the above.

Provided, that nothing in this Power of attorney shall be deemed to authorize the Attorney (s) to represent the Company before any judicial authority.

And I hereby agree that all acts, deeds and things lawfully done by the said Attorney(s), under the power hereby given to them, shall be construed as acts, deeds and things done by the Company and I undertake to ratify and confirm all and whatsoever the said Attorney(s) shall lawfully do or cause to be done by virtue of the powers given by this Power of Attorney.

This Power of Attorney is valid with effect from 18th day of May 2016 for a period of twelve (12) months i.e. upto 17th day of May 2017 or until any one of the above named Attorney(s) leaves the employment of the Company, whichever is earlier.

IN WITNESS: whereof I, Rathindra Nath BASU, have executed these presents on this 18th day of May 2016 at Delhi.

For and on behalf of Alstom T&D India Limited

Witness:

Rathindra Nath Basu
Managing Director

Mr. Arun Choudhary
Regional Managing Director-NMS

Mr. Rohit Poddar
DGM - Commercial, NMS Sales

Mr. Harneet Kanwar
Senior Manager- NMS Sales

Specimen Signatures

Attested:

Rathindra Nath Basu

ATTESTED
R.C. Sharma
NOTARY PUBLIC
GOVT. OF N.C.T., DELHI

19 MAY 2016

ISO 9001:2000 CERTIFIED

পাওয়ার গ্রীড কোম্পানী অব বাংলাদেশ লিঃ
POWER GRID COMPANY OF BANGLADESH LTD.
(An Enterprise of Bangladesh Power Development Board)

Memo No. : 1/PGCB/SE (Com)/ 1510

Date: 13/3/2016

M/s ALSTOM T&D India Limited
A-7, Sector-65, Noida-201301,
Uttar Pradesh, India

Attention: Mr. Arun Choudhary - MD (India Region), NMS

Subject: **Letter of Intent (LOI) for unit price fixation of SCADA integration both in main & backup control center for new power station, substation, line bay, transformer bay, generator bay.**

Dear Sir,

PGCB has accepted the proposal for SCADA integration both in main control center & backup control center of new power station, substation, line bay, transformer bay, generator bay as per negotiation made so far. In this connection, PGCB is issuing this Letter of Intent (LOI) for signing an agreement with you, subject to the acknowledgement, fulfillment and compliance of the following terms & conditions:

a) RTU/SAS supplier has to provide inter-operable data till main & backup control center as per NLDC philosophy.
b) All SCADA database development, power system database modeling and EMS tuning shall be covered by ALSTOM.
c) No hardware shall be in ALSTOM scope.
d) Data validation at main control center with field data.
e) Existing data license of NLDC SCADA system shall be utilized for this purpose.
f) Integration price is valid for the bids which will be invited within December 2017.
g) Above price shall be applicable for a single order for new bays integration in existing substation.
h) In case more than 4 new bays/transformer/generator need to be integrated to existing substation, price of new substation integration (Point No. 1/2) shall be applicable.
i) The above prices are exclusive of all local VAT & TAX.
j) This price will be applicable for all the integration works to NLDC Bangladesh under PGCB or owner of any power plant/ Grid sub-station or Nominated EPC contractors.
k) This price will also be applicable for all the projects which are in pipeline and on-going which will be integrate in near future to NLDC.
l) Scope of works - as per ALSTOM T&D India Limited proposal & negotiated with PGCB

Institution of Engineers Bangladesh (IEB) Bhaban (New), 3rd & 4th Floor, Ramna, Dhaka-1000. Web : www.pgcb.org.bd
PABX : 9553663, 9550514, 9560064,9558054, 7169709, FAX : 880-2-7171833, E-mail : info@pgcb.org.bd

m) Unit prices are fixed for the mentioned period (Point No. f) as below:

Sl No	Work Description	Unit	Qty.	Unit Price EURO + BDT	Total Price EURO + BDT
1	Integration of New RTU/SAS at Control Center (as per technical specs)	Substation	1	Euro 28,500.00 + BDT 15,00,000.00	Euro 28,500.00 + BDT 15,00,000.00
2	Integration of New Power Plant at Control Center (as per the technical specs)	Power Station	1	Euro 28,500.00 + BDT 15,00,000.00	Euro 28,500.00 + BDT 15,00,000.00
3	Integration of New Bay /Transformer /Generator of existing station at Control Center. The same price shall be applicable for integration of 2 bays of the same station.	Bays	1-2	Euro 10,000.00 + BDT 10,00,000.00	Euro 10,000.00 + BDT 10,00,000.00
4	Integration of New Bay /Transformer /Generator of existing station at Control Center - 3 & 4 bays (in the same station).	Bays	3-4	Euro 20,000.00 + BDT 15,00,000.00	Euro 20,000.00 + BDT 15,00,000.00

Acknowledgement and Acceptance of this LOI:

The authorized signatory of M/s ALSTOM T&D India Limited shall acknowledge unconditional acceptance of this LOI within 07 (seven) days from the issuance of this LOI. If M/s ALSTOM T&D India Limited fails to accept this LOI within this stipulated timeframe, the LOI will be canceled automatically. The LOI may be terminated by PGCB upon giving written notice to M/s ALSTOM T&D India Limited.

Yours sincerely,

13/3/2016

(Md. Ashraf Hossain)
Company Secretary

Copy to:

1. Managing Director, PGCB, Dhaka
2. Executive Director, O&M/P&D/Finance, PGCB, Dhaka
3. Chief Engineer, P&D/SO, PGCB, Dhaka
4. Superintending Engineer, Communication Circle, PGCB, Dhaka
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GRID
COUNTRY OFFICE
India

ALSTOM T&D India Limited,
A-7, Sector-65
Noida-201 301, U.P, INDIA
Phone: +91 120 4779500
Fax: +91 120 4779588
www.alstom.com

ALSTOM

ALSTOM Ref No.: **PGCB/INTEGRATION/NMSSALES/004**
Date :**18TH MARCH2016**

To,
Mr. Ashraf Hosain
Company Secretory
Power Grid Company of Bangladesh Limited,

Reference :

1. **Meeting's held on 26th November 2015 at PGCB NLDCRampura**
2. **Our offer Letter no.PGCB/INTEGRATION/NMSSALES/003dtd. 23/02/2016**
3. **MOM no. : 1/PGCB/SE(Com)/1510 dtd. 13/03/2016**

Subject:Acceptance of Letter of Intent (LOI) for fixation of SCADA integration both in main & backup control center for new power station, substation, line bay, transformer bay, generator bay.

Dear Sir,

We acknowledge the receipt of Letter of Intent and accept the integration price along terms & conditions mentioned in the above stated LOI. Request you to please advise us when we can come & sign the agreement.

Thanking you & assuring you of our best support at all times.

Yours Faithfully,

For **ALSTOM T&D India Ltd.**

HARNEET KANWAR

Senior Manager – NMS Sales

Copy:

1. Managing Director, PGCB, Dhaka
2. Executive Director, O&M/P&D/Finance, PGCB, Dhaka
3. Chief Engineer, P&D/SO, PGCB, Dhaka.
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POWER GRID COMPANY OF BANGLADESH LTD.
(An Enterprise of Bangladesh Power Development Board)

Memo No. : 1/PGCB/SE (Com)/ 1570 Date: 13/3/2016

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A-7, Sector-65, Noida-201301,
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Yours sincerely,

13/3/2016

(Md. Ashraf Hossain)
Company Secretary

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Yours sincerely,

13/3/2011

(Md. Ashraf Hossain)
Company Secretary

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Als tom T&D

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POWER GRID COMPANY OF BANGLADESH LIMITED

BIDDING DOCUMENT
FOR
DESIGN, SUPPLY, ERECTION, TESTING & COMMISSIONING AND INTEGRATION WITH NLDC OF 13 NEW GRID SUBSTATIONS ON TURNKEY BASIS

SCHEDULE C

TIMES FOR DELIVERY AND COMPLETION

The individual dates are all contractually binding.

The times given under Column D are the commissioning target dates at present planned to be achieved and may be the subject of mutual adjustment.

Column A details the earliest dates by which access to site can be given for storage purposes. The times entered under column B are to be the dates guaranteed for arrival at Site of the first shipment of parts for the circuits in question being also the dates when the contract requires access to the Site for plant erection, to the extent necessary to enable him to proceed with work to meet the dates under column C guaranteed for complete delivery, erection and commissioning of the shipment.

The times include all necessary control, relay, metering, auxiliary power ancillary equipment to enable the respective circuit or item of plant to be completely commissioned and put into commercial operation, together with such other associated equipment, e.g. busbars, etc as will ensure that subsequent shutdown are unnecessary or at least only of a temporary or short time nature.

The dates assume an order is placed by .....
(to be advised or stated by Bidder)

Site	A* Latest Access Permitted	B* Guaranteed Arrival of first shipment	C* Guaranteed Completion	D* Target Completion
As per requirements	7 days from the date of signing of the Contract		18	

* Time in months, after contract effective date.

Preliminary SLD, overall layout and control building drawings of the Technical Specification shall be provided within 2.0 months of the contract commencing date with final drawings following one month later.

POWER GRID COMPANY OF BANGLADESH LIMITED

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SCHEDULE D

MANUFACTURERS, PLACES OF MANUFACTURE AND TESTING

The following Subcontractors and/or manufacturers are proposed for carrying out the item of the facilities indicated.

Bidders are free to propose more than one for each item.

Item	Description	Proposed Subcontractors/ Manufacturers	Place of Manufacture	Place of Testing and Inspection

POWER GRID COMPANY OF BANGLADESH LIMITED

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SCHEDULE E

TECHNICAL PARTICULARS AND GUARANTEES

PART 1- 48 V BATTERIES AND CHARGERS

Sl. No.	Description	Unit	Bidder's Data
	Battery		
1	Manufacturer		
2	Type		
3	Electrolyte		
4	Nominal voltage	V	
5	Capacity at 5 hour rate	Ah	
6	Number of cells		
7	Float voltage per cell	V	
8	Battery voltage at end of the duty cycle	V	
9	Normal charging rate	A	
10	Maximum charging rate	A	
11	Ampere-hour efficiency at ten hour rate	%	
12	Ampere-hour efficiency at one hour rate	%	
13	Dimensions of cells	mm	
14	Dimensions of battery complete	mm	
15	Weight of cell complete with electrolyte	kg	
16	Internal resistance per cell when fully charged	ohms	
17	Material of battery case		
	Charger		
18	Manufacturer		
19	Type		
20	AC input voltage and range	kVA	
21	DC output of charger	kW	
22	Type of DC voltage control		
23	Range of DC voltage	V	

Sl. No.	Description	Unit	Bidder's Data
24	Output current sharing facility (for parallel operation of chargers)		
25	Regulation	%	
	Charger Cubicle Complete		
26	Manufacturer		
27	Overall dimensions	mm	
28	Total weight	Kg	
	DC Switchboard		
29	Manufacturer		
30	Type		
31	Busbars:		
	- maximum current rating	A	
	- dimensions	mm	
32	Boost charge contactors:		
	- manufacturer		
	- maximum current rating		
	- coil rating		
	- method of interlocking		
33	Alarm relays:		
	- manufacturer		
	- type and reference		
	- power consumption: a) quiescent b) operated	 A mA	
34	Number and rating of distribution circuits		
35	Overall dimensions	mm	
36	Total weight	kg	

PART 2 - FIBRE OPTIC MULTIPLEXER EQUIPMENT

SL. No.	Description	Unit	Bidder's Data
1	**GENERAL:**		
	Manufacturer		
	Model No.		
	Type		
	Type of multiplexer		
	Complying to ITU-T rec.		
	Transmission Capacity	Mbit/s	
	Access capacity on 64 kbit/s	channels	
	Access capacity on 2 Mbit/s	channels	
	Redundant central processor		
	Digital cross connect function		
2	**Available AGGREGATES:**		
	Optical aggregates (ITU-T G.957)		
3	**Available TRUNK INTERFACES:**		
	HDB3, 2 Mbit/s interfaces per module	No.	
	Complying to ITU-T rec.		
	HDSL, 2Mbit/s interface: no of copper wires - Capacity on 2Mbit/s or on 1Mbit/s - Capacity selectable	No. ch ch / pair of wire	
4	**Available USER INTERFACES**		
5	**Voice interfaces for trunk lines:**		
	1 + 1 com path protection, available for all		
	Analogue, 4wire with E&M: Input level Output level	dBr dBr	
	Analogue, 2wire with E&M: Input level Output level	dBr dBr	
	Digital, 2Mbit/s CAS or PRI		
6	**Voice interfaces for remote Subscriber:**		
	2wire, subscriber side	dBr	
	2wire, PABX side	dBr	
7	**Integrated teleprotection**		
8	**Interface for Commands:**		
	Number of independent commands	No.	
	Transmission time max.	ms	
	Signal voltage	Vpeak	
	1 + 1 com path protection		
9	**Interface(s) for Differential Protection:**		
	Electrical interface: G.703	kbit/s	
	Optical Interface	kbit/s	
10	**Data: channels per module**		
	1 + 1 com path protection, available for all		
	V.24/V.28 (RS-232): up to 38.4kbit/s	No.	

SL. No.	Description	Unit	Bidder's Data
	V.11/X.24 (RS-422): 64kbit/s	No.	
	V.35: 64kbit/s	No.	
	V.36 (RS-449): 64kbit/s	No.	
	G.703: 64kbit/s	No.	
	Ethernet: 10/100 BaseT WAN capacity Protocols	No. Mbit/s Mbit/s	
11	**Integrated alarm gathering module:**		
	Number of external alarms per module	No.	
	Auxiliary power supply for ext. contacts		
12	**Network Management System**		
	Type/Name of configuration tool		
	For fault / configuration management		
	For local / remote operation		
	Data communication network (DCN)		
13	**Ambient Conditions:**		
	Storage: ETS 300 019-1-1, class 1.2	°C / % hum	
	Transport: ETS 300 019-1-2, class 2.2	°C / % hum	
	Operation: ETS 300 019-1-3, class 3.1E	°C / % hum	
14	**Power Supply**		
	Operation	VDC	
	Fully redundant power supply		

Bidder shall provide all necessary information which deem to be necessary to complete the project in all respects.

Remote Terminal Unit (RTU)

1			Item	Response
			RTU(General)	Micom C264
	a.		Manufacture	Alstom T & D
	b.		Model Number	C264
	c.		CPU	
		i.	Processor Make/Model	CPU26x (Version-3)
		ii.	Clock Speed	80MHz
		iii.	Read/Write Memory Size	256Mb
		iv.	program Memory Size	64Mb
		v.	Firmware Field Upgrade Method	CMT(Ethernet/ HyperTerminal)
	d.		Maximum Capacities	
		i.	Digital Inputs	5012 binary digital inputs(BI)
		ii.	Analog Inputs	1024 Analog Inputs (AI)
		iii.	Digital Outputs	1024 Digital Outputs (DO)
		iv.	Analog Outputs	Up to 4 AOU Board per Rack
	e.		Master station Communications	
		i.	Number Of Ethernet LAN Ports	3 Nos CPU-3
		ii.	Number Of Serial ports	2 Nos BIU Each
		iii.	Maximum Number Master supported	Multi/Single
		iv.	Dual Redundant paths Supported?	Yes
		v.	Protocols Supplied	IEC61850 Level-A 101,104
	f.		IED Communications	
		i.	Maximum Numbers of Serial ports	2 BIU/ IED
		ii.	Is This Independent of number of Master Station ports?	Yes
		iii.	Protocols Supplied	Modbus
	g.		Power Supply	48V DC
		i.	Dual Redundant Power supply support?	Yes
		ii.	Voltage Input Range	24V DC, 48-60 V DC, 220V DC, 230V AC
		iii.	Capacity/Supply	40 W Max
		iv.	Isolation on input	2KV (RMS), 1 Minute

			Item	Response
	h.		Environment	
		i.	Operating Temperature range	20 ° C (±2 °C)
		ii.	Operating relative Humidity range	45 to 75 %
	i.		Remote I/O	
		i.	Supported?	Yes
		ii.	Characteristics of RTU to Remote I/O Link (media, Speed...)	IEC-104, 101 (up to 9600 Bd)
	j.		Cubical dimensions	800mm X 800mm
2			I/O Modules	
	a.		Digital Inputs	
		i.	Number of points/ Module	16 points/ Module
		ii.	Input Voltage Range	24 - 250 V DV
		iii.	Isolation	2 KV
	b.		Digital Outputs	
		i.	Number of points/ Module	8 points/ Module
		ii.	Isolation	2 KV
	c.		Analogue Inputs	
		i.	Number of points/ Module	4 points/ Module
		ii.	Input Ranges Supported	± 1 to 20 mA
		iii.	A to D converter Resolution	16 bit A/D Converter, 0.05% Accuracy
		iv.	Isolation	2 KV
3			Configuration	
	a.		RTU Configuration System	
		i.	Name of Configuration System	CMT (B4R.39)
		ii.	Version	SCT (3.44)
	b.		Custom Programming Capability	
		i.	Programming Language	JAVA

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SCHEDULE F

DEPARTURES FROM THE SPECIFICATION

Bidders are to list all departures from the requirements of the specification in this schedule.

All departures whether they be commercial, financial, technical or of a contractual nature are to be included and shall be submitted with the Technical proposal

Any item that does not have a departure listed in this schedule will be deemed to be in full accordance with the requirements of the specification.

No other document or detail accompanying the tender will be considered in evaluating departures.
Bidders are not permitted to offer any alternative to this schedule.

Item	Volume	Clause	Detail of Departure from Specification

POWER GRID COMPANY OF BANGLADESH LIMITED

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SCHEDULE G

PROPOSED ALTERNATIVE STANDARDS TO WHICH EQUIPMENT SHALL BE PROVIDED

The bidder shall list below all the alternative engineering and design Standards, which he proposes to use in his design, manufacture and testing of equipment to be supplied. Should these standards differ from the specified standard in any respect, the bidder shall detail the differences between the proposed and specified standard.

Compliance with any standard equal or superior to those specified will be considered acceptable.

In the absence of any listed alternative standard, it is deemed that the standards specified in the Tender documents are fully complied with.

Specified Standard	Alternative Standard	
	Number	Title

POWER GRID COMPANY OF BANGLADESH LIMITED

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SCHEDULE H

PROPOSED CONTRACT & SITE ORGANISATION

Personnel

Bidders should provide the names of suitably qualified personnel to meet the requirements specified in Section 3 (Evaluation and Qualification Criteria) of Volume 1 of 3 of the Bidding Document. The data on their experience should be supplied using the Form below for each candidate.

Form PER – 1: Proposed Personnel

1.	Title of position*
	Name
2.	Title of position*
	Name
3.	Title of position*
	Name
4.	Title of position*
	Name

*As listed in Section 3 (Evaluation and Qualification Criteria).

Form PER – 2: Resume of Proposed Personnel

Position		
Personnel information	**Name**	**Date of birth**
	Professional qualifications	
Present employment	**Name of employer**	
	Address of employer	
	Telephone	**Contact (manager / personnel officer)**
	Fax	**E-mail**
	Job title	**Years with present employer**

Summarize professional experience in reverse chronological order. Indicate particular technical and managerial experience relevant to the project.

From	To	Company / Project / Position / Relevant technical and management experience

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SCHEDULE I

DRAWINGS AND DOCUMENTS TO BE SUBMITTED WITH TENDER

The following drawings/documents shall be submitted with the Tender:

1. Typical layout & sectional drawings and brochures of RTUs.

2. Typical layout & sectional drawings and brochures of Fiber Optic Telecommunication Equipment.

3. Typical layout & sectional drawings and brochures of Batteries and Battery Chargers

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SCHEDULE J

PROPOSED SUBCONTRACTORS

The bidder shall propose a list of the Sub-contractors in the following table as per sub-clause 2.7, Item 2, Civil Subcontractors, Section-3, Evaluation and Qualification Criteria, Volume 1 of 3 of the Bidding Document.

Sl. No.	Name and Address of the Subcontractor

Signature ----------
Date ----------