



BHARAT HEAVY ELECTRICALS LIMITED, JHANSI
(A Govt of India undertaking)
MATERIALS MANAGEMENT (MM) , JHANSI - 284120
TENDER FOR " SUPPLY, INSTALLATION AND COMMISSIONING OF DC DRIVE ,PLC , HMI ALONG WITH COMPLETE CONTROL PANEL FOR MG SET 4."

QUALIFYING REQUIREMENT

Date : 03.03.2020

SL	Description of Qualifying requirement	Copy enclosed.	
1.	Average Annual Financial Turnover: (i) Average annual financial turnover in last 3 years ending on 31 st march 2019 should be at least Rs. 12.8 Lakhs. Bidder to attach Balance sheet and Profit & Loss Statement audited by CA. If Balance sheet of last financial year is not audited, the unaudited balance sheet of last financial certificate of CA can be enclosed.	Submitted	Not Submitted
(ii)	Positive Net Worth of the Bidder: Rs. Lakhs.	Rs. _____	
2.	Experience/ Capabilities: The vendor must have executed at least two Projects of Supply and commissioning of minimum 1300A or 596KW DC Drive within last 10 Years with offer: 1. Purchase order copies of any two Projects executed as above. 2. Commissioning Certificates issued by customer to vendor for these projects. This certificate should mention name of company.	Submitted	Not Submitted
3.	a) The party quoting for this project must be OEM or Authorized dealer/system integrator of OEM of offered Drive. Corresponding valid authorization certificate issued to Party from OEM is to be submitted along with the offer. Offers without proper OEM's authorization certificate will not be considered. b) Self-declaration by the Bidder with an undertaking that they are liable to be proceed against in case of false declaration. The bidder should also declare that BHEL reserve the right to access their facilities at random at any point of time and that they agree for penal action from BHEL in case any of the information furnished by them is found to be false.	Submitted	Not Submitted
4.	Copies of PAN & GSTIN Certificate enclosed.	Submitted	
5.	Self - Certificate/Declaration that (a) the bidder is not suspended by BHEL, Jhansi or any Unit/Office of BHEL or any other organization, and (b) the bidder is not guilty by a court of Law in India for any offence involving fraud, dishonesty and moral turpitude.	Submitted	Not Submitted

Note: Offers received without these documents will not be considered

Signature of Bidder with Seal

Indenter/Convenor

3/3/20
AGMMEX
BHEL JHANSI

AGMMEX 3/3/20

in leave
SDGM/COX

Annexure-A

SPECIFICATION FOR SUPPLY, INSTALLATION AND COMMISSIONING OF DC DRIVE ,PLC , HMI ALONG WITH COMPLETE CONTROL PANEL FOR MG SET 4 OF TRANSFORMER TESTING AREA.

PURPOSE: MG Set 4 is a Motor-Generator test facility at BHEL Jhansi. This set is used as a variable frequency, variable voltage source for transformer testing. Currently the system is controlled by old DS286 drive for both DC Motor (Prime mover) and the AC Generator's excitation control. It is proposed to replace the existing Obsolete drive panel with the latest control Panel comprising microprocessor based Digital DC Drives, PLC system, HMI screen and switchgears. The details of existing DC motor and AC Generator Excitation to be controlled by supplied panel is as below:

1. DC Motor 596 KW: Excitation: Separately excited, Armature 1080 A & Volts-600VDC, Excitation: 230V, RPM 1350, Tacho 0.1V/RPM.
2. AC Generator coupled with above motor: Volts 11000V, KVA- 500/1000, KW 110/150, Hx 40/50/80 Hz, Excitation amps: 517A, Volts 82.7VDC , Connection: Star Delta.Poles 16. PF 0.2 Lag

Note: 1. The input transformer (925KVA, 11KV/545V, 3 Phase, 50Hz.) required for input power supply to thyristor bridge rectifier of armature circuit of DC Motor is available and can be used.
 2. The transformer (5KVA, 440V/240V, 3 ph. 50Hz.) required for the input power supply for DC motor field is available and can be used.. Provision has to be made in the supplied panel for accomodating this transformer.
 3. The transformer (65 KVA, 440V/85V 3 Ph. 50Hz) required for input power supply of AC Generator field is available and can be used. Provision has to be made in the supplied panel for accomodating this transformer.

A) SCOPE OF SUPPLY

S No.	DESCRIPTION	Qty	VENDOR TO SPECIFY/CONFIRM/NOTE
1.0	DC DRIVE FOR MOTOR WITH FOLLOWING MINIMUM SPECIFICATIONS/FEATURES	1 no.	VENDOR TO SPECIFY & CONFIRM
1.1	Input Voltage : 3 Ph. AC 545V 50Hz		VENDOR TO SPECIFY & CONFIRM
1.2	Output Voltage: Armature: 600V DC		VENDOR TO SPECIFY & CONFIRM
1.3	Output Current : Armature: 1300 A		VENDOR TO SPECIFY & CONFIRM
1.4	Output Voltage: Field: 240V DC		VENDOR TO SPECIFY & CONFIRM
1.5	Digital inputs: 4		VENDOR TO SPECIFY & CONFIRM
1.6	Digital Outputs: 4		VENDOR TO SPECIFY & CONFIRM
1.7	Analog inputs: 2.		VENDOR TO SPECIFY & CONFIRM
1.8	Analog outputs: 2.		VENDOR TO SPECIFY & CONFIRM
1.9	Tacho input: 150VDC		VENDOR TO SPECIFY & CONFIRM
1.10	Braking: Not required.		VENDOR TO SPECIFY & CONFIRM

(Signature)
 Sr. Manager (WEX)

(Signature)
 Dy. Manager (WEX)
SATISH SONI

(Signature)
 Dy. Engineer (WEX)

(Signature)
 Sr. Manager (CQX Testing)
Dheerendra

Annexure-A

SPECIFICATION FOR SUPPLY, INSTALLATION AND COMMISSIONING OF DC DRIVE, PLC, HMI ALONG WITH COMPLETE CONTROL PANEL FOR MG SET 4 OF TRANSFORMER TESTING AREA.

PURPOSE: MG Set 4 is a Motor-Generator test facility at BHEL Jhansi. This set is used as a variable frequency, variable voltage source for transformer testing. Currently the system is controlled by old DS286 drive for both DC Motor (Prime mover) and the AC Generator's excitation control. It is proposed to replace the existing Obsolete drive panel with the latest control Panel comprising microprocessor based Digital DC Drives, PLC system, HMI screen and switchgears. The details of existing DC motor and AC Generator Excitation to be controlled by supplied panel is as below:

1. DC Motor 596 KW: Excitation: Separately excited, Armature 1080 A & Volts-600VDC, Excitation: 230V, RPM 1350, Tacho 0.1V/RPM.

2. AC Generator coupled with above motor: Volts 11000V, KVA- 500/1000, KW 110/150, Hx 40/50/80 Hz, Excitation amps: 517A, Volts 82.7VDC, Connection: Star Delta. Poles 16. PF 0.2 Lag

Note: 1. The input transformer (925KVA, 11KV/545V, 3 Phase, 50Hz.) required for input power supply to thyristor bridge rectifier of armature circuit of DC Motor is available and can be used.

2. The transformer (5KVA, 440V/240V, 3 ph. 50Hz.) required for the input power supply for DC motor field is available and can be used. Provision has to be made in the supplied panel for accommodating this transformer.

3. The transformer (65 KVA, 440V/85V 3 Ph. 50Hz) required for input power supply of AC Generator field is available and can be used. Provision has to be made in the supplied panel for accommodating this transformer.

A) SCOPE OF SUPPLY

S No.	DESCRIPTION	Qty	VENDOR TO SPECIFY/CONFIRM/NOTE
1.0	DC DRIVE FOR MOTOR WITH FOLLOWING MINIMUM SPECIFICATIONS/FEATURES	1 no.	VENDOR TO SPECIFY & CONFIRM
1.1	Input Voltage : 3 Ph. AC 545V 50Hz		VENDOR TO SPECIFY & CONFIRM
1.2	Output Voltage: Armature: 600V DC		VENDOR TO SPECIFY & CONFIRM
1.3	Output Current : Armature: 1300 A		VENDOR TO SPECIFY & CONFIRM
1.4	Output Voltage: Field: 240V DC		VENDOR TO SPECIFY & CONFIRM
1.5	Digital inputs: 4		VENDOR TO SPECIFY & CONFIRM
1.6	Digital Outputs: 4		VENDOR TO SPECIFY & CONFIRM
1.7	Analog inputs: 2.		VENDOR TO SPECIFY & CONFIRM
1.8	Analog outputs: 2.		VENDOR TO SPECIFY & CONFIRM
1.9	Tacho input: 150VDC		VENDOR TO SPECIFY & CONFIRM
1.10	Braking: Not required.		VENDOR TO SPECIFY & CONFIRM

(Signature)
Sr. Manager (WEX)

(Signature)
Dy. Manager (WEX)
CATISH SONI

(Signature)
Dy. Engineer (WEX)

(Signature)
Sr. Manager (COX Testing)
Dheerendra

1.11	Provision for online status monitoring and parameterization.		
1.12	Drive mounted display (intelligent Operating panel) to view and enter parameters, display faults Upload/download backup	1 no.	VENDOR TO CONFIRM
1.13	Communication cable with necessary adapters for Drive programming through laptop.	1 no.	VENDOR TO CONFIRM
1.14	Programming software CD/DVD for monitoring/programming drive parameters from Laptop (laptop not in scope)	1 no.	VENDOR TO CONFIRM

2.0	DC DRIVE FOR GENERATOR EXCITATION WITH MINIMUM SPECIFICATIONS/FEATURES	1 no.	VENDOR TO SPECIFY & CONFIRM
2.1	Input Voltage : 3 Ph. AC 400V, 50Hz		VENDOR TO SPECIFY & CONFIRM
2.2	Output Voltage: Armature: 0- 400V DC		VENDOR TO SPECIFY & CONFIRM
2.3	Output Current : Armature: 600 A		VENDOR TO SPECIFY & CONFIRM
2.4	Digital inputs: 4		VENDOR TO SPECIFY & CONFIRM
2.5	Digital Outputs: 4		VENDOR TO SPECIFY & CONFIRM
2.6	Analog inputs: 2.		VENDOR TO SPECIFY & CONFIRM
2.7	Analog outputs: 2.		VENDOR TO SPECIFY & CONFIRM
2.8	Provision for online status monitoring and parameterization.		VENDOR TO CONFIRM
2.9	Drive mounted display (intelligent Operating panel) to view and enter parameters, display faults Upload/download backup	1 no.	VENDOR TO CONFIRM
2.10	Communication cable with necessary adapters for Drive programming through laptop.	1 no.	VENDOR TO CONFIRM
2.11	Programming software CD/DVD for monitoring/programming drive parameters from Laptop (laptop not in scope)	1 no.	VENDOR TO CONFIRM

3.0	PLC BASED SYSTEM FOR CONTROL PANEL WITH FOLLOWING MINIMUM SPECIFICATIONS		VENDOR TO SPECIFY & CONFIRM
3.1	PLC CPU with Memory card of suitable capacity.		VENDOR TO SPECIFY & CONFIRM
3.2	Digital inputs: 72 nos.		VENDOR TO SPECIFY & CONFIRM
3.3	Digital outputs: 48 nos.		VENDOR TO SPECIFY & CONFIRM
3.4	RTD inputs: 4 nos.		VENDOR TO SPECIFY & CONFIRM
3.5	Analog Inputs: 8 nos.		VENDOR TO SPECIFY & CONFIRM
3.6	Analog Outputs: 8 nos.		VENDOR TO SPECIFY & CONFIRM
3.7	Networking hardware, mounting plate, connectors, interfacing cards as required.		VENDOR TO SPECIFY & CONFIRM
3.8	Other misc. items required for installing above PLC System.		VENDOR TO SPECIFY & CONFIRM
3.9	One Panel mounted HMI OF MIN 10 INCH DISPLAY for I/O status, Alarms, and operation info.		VENDOR TO SPECIFY & CONFIRM
3.10	PLC and HMI Programming software in CD/DVD , with License , programming cable and adapter.		VENDOR TO CONFIRM

Signature of Sr. Manager (WEX)
 04/02/2020
 SATISH SONI

Signature of Dy. Engineer (WEX)
 04/02/2020
 Dy. Engineer (WEX)

Signature of Sr. Manager (CQX Testing)
 04/02/2020
 Sr. Manager (CQX Testing)

4.0	RITTAL/BCH/ABB make, IP55 floor mounted Control panels to fit within Max floor dimensions of 1250mm (width) x 4500mm (Length) for supplied drives with following minimum items Prefitted and wired.	1 no.	VENDOR TO SPECIFY & CONFIRM
4.1	Contactors, Control Relays, Fuse- TBs with indication, control cable etc as per requirement	1 SET	VENDOR TO CONFIRM
4.2	Display Meters: For display of Motor Arm current & Voltage, Speed,	1 SET	VENDOR TO CONFIRM
4.3	Motor Field Current & Voltage, Gen O/p freq.	1 SET	VENDOR TO CONFIRM
4.4	R, Y, B Indication LED lamps for input phase check.	1 SET	VENDOR TO CONFIRM
4.5	Voltmeter and Ammeter for AC input supply monitoring.	1 SET	VENDOR TO CONFIRM
4.6	KV voltmeter with associated wiring upto a TB in panel for showing generator KV.(0-110V AC from PT shall be provided by BHEL.		VENDOR TO CONFIRM
4.7	The DC Motor Drive and Alternator's excitation shall be either controlled locally though panel mounted push buttons as mentioned below or remotely through existing Control desk located in test gallery. The 15 no. potential free contacts for the purpose shall be provided by BHEL Upto Panel.	1 SET	VENDOR TO CONFIRM
4.8	Push buttons with indication for control of drive in local mode 1. Gen Freq Raise. 2. Gen Freq Lower. 3. Excitor Raise. 4. Excitor lower. 5. Drive fault reset 6. Lamp test. 7. motor field on.	1 SET	VENDOR TO CONFIRM
4.9	8. Motor field off. 9. Gen. Field AC Cont. ON. 10. Gen Field AC Cont. OFF.		
4.10	11. Gen Field DC Contactor off. 12. ACB ON 13. ACB OFF 14. Armature DC ON/OFF & 4 extra PBs		
4.11	24V LED Indications for 1. Drive Run. 2. Drive fault, 3. Drive ready. 4. Generator field ON/OFF	1 SET	VENDOR TO CONFIRM
4.12	Motor field ON/OFF. 5. Motor Armature DC ON/OFF. 6. AUX ON/OFF. 7. MCCB on 8. TRIP		
4.13	9. ACB ON/OFF, 10. HT ACB ON/OFF, 11. ACB ready, & 3 Extra	1 SET	VENDOR TO CONFIRM
4.14	Emergency PB.	1 SET	VENDOR TO CONFIRM
4.15	Heavy duty Selector switches for Input phase voltage check. Local/remote selection etc..	1 SET	VENDOR TO CONFIRM
4.16	Potentiometers 10 Turn x 3 nos. for local mode speed setting.	1 SET	VENDOR TO CONFIRM
4.17	Semiconductor Fuses of suitable rating for both Drives.	1 SET	VENDOR TO CONFIRM
4.18	Power supply 24VDC 10 A for PLC, I/O control x 2 Nos.	1 SET	VENDOR TO CONFIRM
4.19	RTD PT100 Probe for monitoring Ggenerator and DC motor bearing temp. x 2 nos.	1 SET	VENDOR TO CONFIRM
4.20	MCBs, MCCBs, CT, PT, OLRs, etc as per control panel/application requirement.	1 SET	VENDOR TO CONFIRM
4.21	Panels internal control & power cable, lugs, ferrules, TBS, etc as per requirement.	1 SET	VENDOR TO CONFIRM
4.22	A single ph. 240V AC 5A Aux supply socket & switch inside each panel enclosure.	1 SET	VENDOR TO CONFIRM
4.23	Illumination lights, Panel blowers with associated switchgears for each panel enclosure.	1 SET	VENDOR TO CONFIRM
4.24	Input supply phase sequence detector	1 SET	VENDOR TO CONFIRM
4.25	Other miscellaneous items not mentioned above but required for MG Set control panel commissioning shall be considered in scope of vendor.	1 SET	VENDOR TO CONFIRM

6/12/20

Sr. Manager (CQX Testing)

6/12/20

Dy. Engineer (WEX)

6/12/20

Dy. Manager (WEX)

SATISH SONI

6/12/20

Sr. Manager (WEX)

B) SCOPE OF WORK.

5.1	Disconnection of motor, generator, supply cables and control wiring after proper tagging and noting down.		
5.2	Complete Uninstallation of existing Control panel from the site.		
5.3	Erection, Installation of New Control panel with supplied electrical items in place of old panel.		
5.4	Interfacing of field cables & control wiring with the supplied new panel		
5.5	Installation and commissioning of Existing items as detailed in "Note: of Purpose in heading." in the new supplied panel.		
5.6	Complete Control and Power wiring inside new panel.		
5.7	Drive parameterization/optimization for achieving Excitation control of AC Generator in complete range.		
5.8	Drive parameterization/optimization for achieving DC Motor control in zero to full speed range.		
5.9	All the control wiring should have proper tagging & ferrules, Legends for different electrical items like MCB contactors and relays etc. with proper references shall be mentioned in electrical drawing.		
5.10	Development of PLC program and HMI screens for MG Set 4 Motor and Excitation control as per Transformer test requirement specified by BHEL/User.		
5.11	The control supply shall be 24VDC for all relay and contactors.		
5.12	Installation commissioning, testing & prove-out of "complete MG Set system" through new control panel on 2 BHEL Jobs.		
5.13	Miscellaneous work not specifically mentioned but required to be done for installation and commissioning of supplied panel shall also be considered in scope by the supplier.		
	The supplier may visit the Existing MG Set and its old control panel at BHEL Jhansi for detailed study before quoting.		

1 SET

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C) ACCEPTABLE MAKES OF MAJOR COMPONENTS

6.1	Drive, HMI & PLC, - ABB/Siemens/Yaskawa/Allen-Bradley		
6.2	Control Panel: - RITTAL /ABB/BCH make only.		
6.3	Switchgear: - ABB/L&T/Siemens/Legrand/schneider only		
6.4	Drive Fuses: - Siemens/ABB/Bussman/cooper/ferraz		

VENDOR TO SPECIFY & CONFIRM
VENDOR TO SPECIFY & CONFIRM
VENDOR TO SPECIFY & CONFIRM
VENDOR TO SPECIFY & CONFIRM

(Signature)
04/02/2020

Dv. Manager (WEX)

(Signature)
05/02/2020

Dy. Engineer (WEX)

Sr. Manager (CQX Testing)

D) DOCUMENTATION

7.1	Complete manual of system containing detailed electrical drawing of panel as commissioned, PLC ladder diagram with comments, HMI program, drive manual & parameters Operation manual shall be provided in soft and hard bind 3 sets.	1 SET	VENDOR TO CONFIRM
7.2	Soft copies of PLC, drive & HMI backup file with comments in English is to be provided..PDF copy of PLC Ladder, drive parameters and screens of HMI as commissioned all in one 16GB Pen drive.	1 SET	VENDOR TO CONFIRM
E) GUARANTEE/WARRANTY			
8.1	All the supplied items and complete panel shall be under warranty for Two years from date of commissioning and acceptance at BHEL. If any problem is reported to party within these two years, the party shall rectify the same to the satisfaction of BHEL within reasonable time.		VENDOR TO CONFIRM

F) TRAINING

9.1	The supplier shall provide min 5 days training on commissioning/maintenance of supplied Drive to two BHEL Engineers at the authorised training center of Drive's OEM. Vendor to provide OEM's Training calendar from which BHEL Shall opt suitable dates and inform the supplier to arrange training. TA DA lodging expenses not in scope of supplier.	1 SET	VENDOR TO CONFIRM
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G) INSPECTION

10.1	The panel shall be inspected by BHEL or their authorized representative before despatch from suppliers works.inspection call to be raised at least 2 weeks before the date of inspection.		VENDOR TO CONFIRM
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H) TECHNICAL QUALIFYING REQUIREMENT

11.1	The party quoting for this project must be OEM or Authorized dealer/system integrator of OEM of offered Drive. Corresponding valid authorization certificate issued to Party from OEM is to be submitted along with the offer. Offers without proper OEM's authorization certificate will not be considered.	1 SET	VENDOR TO CONFIRM
11.2	The vendor must have executed at least two Projects of Supply and commissioning of minimum 1300A or 596KW DC Drive within last 10 Years of due date of this enquiry. Following documents must be submitted along with offer: 1. Purchase order copies of two Projects executed as above. 2. Commissioning Certificates issued by customer to vendor for these projects. This certificate should mention name of company. Note: Offers received without these documents will not be considered.	1 SET	VENDOR TO CONFIRM

(Signature)
Sr. Manager (WEX)

(Signature) 04/02/2020
Dy. Manager (WEX)
SATISH SONI

(Signature) S.M. (WEX)
Dy. Engineer (WEX)

(Signature) 6/2/20
Sr. Manager (CQX Testing)