Indent no. 20156463

TECHNICAL SPECIFICATION CUM COMPLIANCE OF AC HV SERIES & PARALLEL RESONANT TEST SYSTEM.					
Spec. No.:QC-1/RTS HV /20156463/Rev 00					
Indent No. 20156463 dt. 18.04.2016					
1.	Vendor must submit complete information against Pre- Qualifying Requirement. The offer meeting this clause would only be processed.				
2.	The "offered" column and wherever applicable the "deviation" and "remark "column of this format shall be filled in by the vendor and submitted along with the offer. Inadequate, incomplete, ambiguous, unsustainable information against any of the clause of the specification or requirement shall be treated as non-compliance.				
3	The offer and all documents enclosed with the offer should be in english language only.				
Clause no.	**Description for BHEL Requirement**	**Vendor to note /confirm/specify**	**Vendor's comments(noted/ confirmed)**	**Deviation (if any)**	**Remark**
1	**Purpose:**				
1.1	AC high voltage test system is required for carrying high voltage test, partial discharge test, and tan delta test of Turbo generator stator and rotor of different ratings (up to 1000 MW).	Vendor to note			
2.1	**Scope**				
2.1.1	The scope of supply includes design, manufacturing, testing, pre dispatch inspection by BHEL, supply, installation & commissioning and job prove out of AC HV series & parallel resonant test system at BHEL Haridwar. **Quantity: 1 no.**	Vendor to note			
2.2	**Test object detail**				
2.2.1	**Stator Winding** :The system shall be capable of testing individual phases as well as on complete stator winding i.e 3 phases for high voltage test, partial discharge test and tan delta test with and without water distillate in the winding.	Vendor to note			
2.2.2	**Rotor Winding**: High voltage test on generator rotor winding is performed at voltages varying 1 KV to 6 KV.	Vendor to note			
3	**Specification:**				
3.1	**Equipment Parameter**				
3.1.1	HV test system should provide full power with a minimum system Quality factor "Q" (Output KVA/Input KVA) of 10.	Vendor to confirm			
3.1.2	Input supply : 415 V±10 %, Phase -Phase , 50 Hz±1.5	Vendor to confirm			
3.1.3	Output rating: HighVoltage output should have two taps	Vendor to confirm			
3.1.3.1	Tap1: 0-75 KV,AC sine wave with total harmonics distortion ≤5%, 25 A, 1875 kVA,50 Hz	Vendor to confirm			
3.1.3.2	Tap2: 0-45 KV,minimum 25 Amps,AC sine wave with total harmonics distortion ≤5%	Vendor to confirm			
3.1.4	Mode of operation: Series and Parallel resonant both	Vendor to confirm			
3.1.5	PD Level: ≤10 p C at 75 KV of HV test system	Vendor to confirm			
3.1.6	Load capacitance: 0 n F to 1.06 µF at Tap1(75 KV)	Vendor to confirm			
	and 0 n F to 1.8 µF at Tap 2 (45 KV)				
3.1.7	Cooling: Oil natural, Air natural	Vendor to confirm			
3.1.8	Output Display: (LCD/LED) Digital panel Meter Accuracy ≤1%	Vendor to confirm			
3.1.9	Overall measurement uncertainity of the equipment ≤ 3%	Vendor to confirm			
3.2.0	Low Voltage filter: Low voltage filter shall be supplied for blocking noise.	Vendor to confirm			
3.2.1	Duty cycle: 30 minute ON,30 Minute off, 6 times a day or more	Vendor to confirm			
3.2.2	The low voltage end of secondary exciter winding should have the option of electrical isolation from earth point(for tandelta measurement)	Vendor to confirm			
4	**Tank type AC HV Series & Parallel Resonant test system shall be comprising following minimum equipments**	Vendor to confirm			
4.1	**High Voltage Reactor:**				
4.1.1	Rating: 75 KV,1875 KVA,50 Hz	Vendor to confirm			
4.1.2	HV reactor shall be tank type and oil insulated.	Vendor to confirm			
4.1.3	Mode of operation : AC HV test system shall be operated in both Series and Parallel resonant mode.	Vendor to confirm			
4.1.4	Bushing:Single bushing for HV output	Vendor to confirm			

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4.1.5	Series and parallel resonance mode should be able to interchange manually.	Vendor to confirm			
4.1.6	HV tap connection: Two taps at 75 KV and 45 KV which shall be selected via manual tap switch selector.	Vendor to confirm			
4.1.7	Reactor drive: Variable speed drive with electromagnetic brake to hold reactor during use.	Vendor to confirm			
4.1.8	Reactor Drive over load protection.	Vendor to confirm			
4.1.9	Reactor has to be equipped with temperature sensor to sense the internal oil temperature with over temperature protection.	Vendor to confirm			
5	**Exciter Transformer:**				
5.1	Rated Power : 187.5 KVA or more	Vendor to specify			
5.2	The exciter transformer output shall be suitably protected by a lighting arrestor to absorb the energy stored in the reactor inductance which is reflected during a flashover back to the Exciter transformer.	Vendor to confirm			
5.3	Exciter voltage and exciter current measurement facility	Vendor to confirm			
6	**Voltage Regulator:**				
6.1	Rated Power : 187.5 KVA or more	Vendor to specify			
6.2	Volatge resolution: Regulating transformer to vary input voltage to test system with no steps	Vendor to confirm			
6.3	It shall be over current and short circuit protected.	Vendor to confirm			
6.4	Adjustable rate of rise with motorised regulation	Vendor to confirm			
7	**Additional features:**				
7.1	Control system to be provided in unit which is required for manual operation.	Vendor to confirm			
7.2	Keyswitch for control power combined with emergency off pushbutton switch .	Vendor to confirm			
7.3	Control Power and main power on indication lamps.	Vendor to confirm			
7.4	Provision of Caution Light (with flasher) and Audio Buzzer (with volume control) while HV Test system is 'ON'.	Vendor to confirm			
7.5	High voltage on/off pushbuttons with indicating lights.	Vendor to confirm			
7.6	Output voltage control from near zero to full voltage with raise/lower pushbuttons and indicating lights.	Vendor to confirm			
7.7	Push buttons form changing reactance when tuning to resonance in manual mode and auto mode facility with resonance achieved indication.	Vendor to confirm			
7.8	Arc detector trip indicator / reset switch with arc trip level (sensitivity potentiometer)	Vendor to confirm			
7.9	Equipment should be provided with " Zero start" interlock fetaure so that regulating voltage always starts at zero voltage.	Vendor to confirm			
7.1	Digital test timer shall be provided	Vendor to confirm			
7.11	Automatic inbuilt discharging to earth facility to be available once the HV switch off or one no. earthing rod of suitable length and voltage to be supplied	Vendor to confirm			
7.12	Equipment should be supplied with suitable earthing cable of 40 meter length each	Vendor to confirm			
7.13	The readings of the equipment shall be stable and repeatable	Vendor to confirm			
7.14	Ambient operating conditions for the system: 5°C to 40°C and up to 90% RH (non-condensing)	Vendor to confirm			
7.15	Noise level in equipment should be less than 90 dB at a distance of 1 meter from equipment.	Vendor to confirm			

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8	**Accessories:**				
8.1	All accessories required for smooth functioning of equipment are to be supplied.	Vendor to confirm			
9	**Spares:**				
9.1	Spares required for trouble free operation are to be quoted seperately with price bid , giving description , quantity and price of each item seperately as per **Annexure-I.**	Vendor to confirm			
14	**Training:**				
14.1	Training regarding equipment in the areas of operation, Mechanical /Electrical /Electronics maintenance should be provided during PDI/commissioning.	Vendor to confirm			
15	**Documents:**				
15.1	Vendor shall supply two copies of following documents in English language.	Vendor to confirm			
15.2	Operation & Instruction manual	Vendor to confirm			
15.3	Maintenance manual along with circuit diagrams, laying ,wiring diagram,schematic of assemblies and components.	Vendor to confirm			
15.4	Details like make, model and specification of various components items.	Vendor to confirm			
15.5	Test certificate and warrantee/guarentee certificate	Vendor to confirm			
15.6	Calibration certificate of HV test system and digital panel meters	Vendor to confirm			
16	**Warrantee**				
16.1	Minimum 12 months from date of commissioning.	Vendor to confirm			
17	**Pre dispatch inspection:**				
17.1	BHEL reserves the right to conduct pre-dispatch inspection at suppliers works before despatch.	Vendor to confirm			
17.2	supplier shall demonstrate all features of test system and its **working at rated parameters.**	Vendor to confirm			
17.3	AC HV test system need to be tested for its Partial Discharge value at rated voltage at supplier's works in presence of BHEL representative and it should meet the PD requirement of specification,refer clause no. 3.1.5	Vendor to confirm			
17.4	The vendor shall provide Inspection Certificate to BHEL Personnel deputed for inspection and two copies shall be supplied along with equipment.	Vendor to confirm			
17.5	Travel, boarding & lodging expenditure of BHEL personnel deputed for PDI will be borne by BHEL.	Vendor to note			
17.6	PDI call must reach BHEL at least four weeks in advance.	Vendor to confirm			
18	**Packing:**				
18.1	The equipment shall be suitably packed to prevent any damage during transport and storage.	Vendor to confirm			
19	**Transportablity:**				
19.1	The complete equipment i.e. HV Reactor, Excitation Transformer, Voltage Regulator along , Control Panel etc shall be fixed on a common platform	Vendor to confirm			
19.2	The complete equipment shall be portable. It should be provided with lifting arrangement to shift it from one place to other with the help of crane	Vendor to confirm			
20	**Installation and commissioning:**				
20.1	Installation and commissioning of the equipment at BHEL works, Haridwar.	Vendor to confirm			
20.2	Successful job prove out on one no. stator of 500 MW/660 MW /700 MW / 800 MW provided by BHEL, at BHEL WORKS, Haridwar.	Vendor to confirm			
20.3	Demonstration of all features of the equipment to the satisfaction of BHEL engineer for their efficient and effective use.	Vendor to confirm			
21	**Safety :**				
	Equipment should have adequate and reliable safety interlock/devices to avoid damage to the equipment, test object and the operator due to malfunctioning or mistakes.	Vendor to confirm			

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Annexure-I

Spares List of HV test system

Item	Quantity
1. Fuse	2 no. each type
2. Lamps/Indicators	2 no. each type
3. Pushbutton/Selector switch/Toggle switch	1 no. each type
4. Relay/contactor	1 no. each type
5. Variac brush	1 set
6. Arc detector PCB	1 no.
7. Main controller circuit PCB	1 no.
8. Voltmeter circuit PCB	1 no.

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Pre-Qualification Requirement (PQR)

1. The bidder should be original equipment manufacturer (OEM) or their authorized representative. In case of authorized representative, authorization letter of the OEM to be submitted.

2. The OEM should have the experience of manufacturing AC HV resonant test system for the last 10 years prior to tender opening date (Evidence in the form of list of supplies, year wise, to be submitted for the mentioned period).

3. The bidder should have supplied at least one no. of AC HV resonant test system of rating 75 KV & 1875 KVA or higher in past 10 years prior to tender opening date. The above equipment must be working satisfactorily at customer's premises. Following documents need to be submitted against satisfactory performance.

   3.1 Un-priced copy of purchase order.
   3.2 Name of the customer / company where above system is installed.
   3.3 Year of commissioning.
   3.4 Name and designation of the contact person of the customer.
   3.5 Phone and email address of the contact person of the customer.
   3.6 Evidence of satisfactory performance of the equipment from customer (issued within 2 years prior to tender opening date).

4. In case the bidder is authorized representative of OEM, the complete system should be sourced from OEM only. Bidder to confirm the same in its letter head.

5. Technical details of the offered instrument in the form of detail catalogues, drawings / photographs of the AC HV test system, total weight of the system and accessories / attachments should be submitted along with the offer.

6. OEM should have service center / authorized service agent located in India. Necessary evidence in the form of authority letter & service invoice of OEM equipment is to be submitted. The above is not required for indigenous manufacturer.

7. BHEL reserves the right:
   - To verify the information provided by the bidder.
   - To seek additional information to verify the details provided.
   - The offered bid shall be rejected for any false information.

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