S.No	Item	BHEL specification	Offered specification
1	**Stack Configuration**	3-phase diode bridge rectifier, brake chopper and 3-phase IGBT based inverter. The IGBTs should be connected in three phase bridge configuration on suitable heat sinks with cooling fans for forced air cooling.	
2	**Inverter Topology**	Two level	
3	**Power rating of Rectifier and Inverter**	1100KW at 0.8 p.f i.e. 1375 kVA	
4	**Rated DC link voltage**	930 V +10%/-15%	
5	**DC link Capacitance**	Type: Polypropylene Value: Offer should specify the required capacitance to meet the ripple current. It should be supported with calculations.	
6	**Required voltage rating of the dc link capacitor bank**	Minimum 1250V	
7	**Maximum dc voltage withstand capability**	The supplier should mention the maximum value of the dc voltage that the offered stack can withstand without damage to any component.	
8	**Current rating of the dc link capacitor bank**	The capacitor bank of the offered 1375kVA stack should be able to supply harmonic current when operating at switching frequency of 1.5 kHz.	
9	**Normal output AC current**	1150A RMS continuous	
10	**Over load capacity**	150% of the normal output current for 60sec for every 10 min	
11	**Output AC voltage**	The offered stack should be suitable to generate ac output voltage of 690V, 3-phase, 50Hz from the 930V dc with switching signals from the controller	
12	**Brake chopper**	Brake chopper should operate for DC voltage of 1200V with a duty ratio from zero to unity with switching frequency 1.5khz at an ambient of 50 degree C.	
13	**Switching frequency**	The offered stack should be able switch at 1.5kHz and also should supply 1150A RMS current at this switching without exceeding the allowable junction temperatures of the IGBTs and diodes	
14	**Stack should include gate drivers**	Specify yes or no	
15	**Specifications of gate drivers**	The gate drivers should have optical inputs to receive inputs and should give IGBT healthy status through	

		optical output. It should have in-built protections against shoot through fault, over current and high di/dt. Also it should generate isolated power supply from the control power supply.	
16	**Connections between capacitors and IGBTs**	The dc capacitors should be connected to IGBTs through laminated bus bars to achieve very low stray inductance between capacitor and IGBT connections	
17	**Thermal calculations**	Detailed temperature-rise calculations for the assembled power stacks (Rectifier, Inverter and brake chopper) for both continuous operation and also for 150% operation for 60sec for every 10 min, should be submitted along with the offer, by clearly indicating the junction temperatures of IGBT, built-in diode, heat sink, outlet Air temperature…etc for an ambient temperature of 50 degrees C. (Please note that brake chopper draws a current of 1000A at dc link voltage of 1200V for 10 sec only)	
18	**Type of cooling**	Forced air	
19	**Thermal Trip switch**	Thermal trip switch with potential free contacts should be mounted on heat sink for the purpose of thermal protection.	
20	**Mechanical design of the stack**	The mechanical design of the stack should be maintenance and replacement friendly.	
21	**OGA of the stack**	The offer should include OGA of the stack	
22	**Data sheets**	The offer should include data sheets of IGBT, diodes, gate driver, heat sink, dc link capacitor, cooling fan and thermal trip switch.	
23	**Stack configuration**	There should not be paralleling of stacks to meet the requirement. (if required, devices can be paralleled.) Specify yes/no	
24	**Tests**	The offer should include list of type and routine tests that will be carried out at supplier's premises before dispatch clearance.	