



**TENUGHAT VIDYUT NIGAM LIMITED**  
**2x210 MW Tenughat Thermal Power Station**  
**Jharkhand**  
**Dry Fly Ash Collection & Disposal System**



**11.00 PERFORMANCE GUARANTEES & LIQUIDATED DAMAGE**

11.01 The Bidder shall furnish performance guarantees of the following parameters. The Bidder will, during the tests, demonstrate the guaranteed figures of the equipment as well as of the systems.

**11.02 Performance Guarantee under Demonstration and Liquidated Damage (LD)**

Break up of total power consumption

Sl. No	Description of equipment	No. of equipments (W+SB)	Rating of each equipment in kW	Guaranteed aux. Power consumption for all working equipment at rated capacity (kW)
a)	Pneumatic Conveying Compressor	Tender to indicate	Tender to indicate	Tender to indicate
b)	Fluidizing Air Blower (Main Silo)	Tender to indicate	Tender to indicate	Tender to indicate
c)	Fluidizing Air Blower (intermediate silos and ash hoppers)	Tender to indicate	Tender to indicate	Tender to indicate
d)	Air Heater for Fluidizing Blowers (Main Silo)	Tender to indicate	Tender to indicate	Tender to indicate
e)	Air Heater for Fluidizing Blowers (Intermediate Silo)	Tender to indicate	Tender to indicate	Tender to indicate
f)	Rotary feeder for main silos unloading	Tender to indicate	Tender to indicate	Tender to indicate
g)	Rotary ash conditioners	Tender to indicate	Tender to indicate	Tender to indicate
h)	Vent air fan of main silos	Tender to indicate	Tender to indicate	Tender to indicate
i)	Air dryers	Tender to indicate	Tender to indicate	Tender to indicate
j)	CW Pumps	Tender to indicate	Tender to indicate	Tender to indicate
K)	Booster pumps	Tender to indicate	Tender to indicate	Tender to indicate
l)	Dosing pumps	Tender to indicate	Tender to indicate	Tender to indicate
m)	Fans used in cooling tower, if any	Tender to indicate	Tender to indicate	Tender to indicate



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n)	Any other equipment not specified above	Tender to indicate	Tender to indicate	Tender to indicate
	Total			Tender to indicate

The non-achievement of guaranteed parameters specified above shall be applied with Liquidated Damage (LD) as per provision of volume-I. Tenderer shall furnish these data along with the offer.

Items for which Liquidated Damage (LD) shall be applied on account of non-fulfillment of Performance Guarantee (PG) parameters shall be as under:-

**Performance Guarantee under Demonstration & LD**

Sl. No	Performance	LD Amount (INR)	Power consumption
			Total Power Consumption (KW) for all working equipments at rated capacity of ash handling and conveying system
1.	Power Consumption : For Increase in each one KW of total power consumption for the plant & equipment at rated capacity as specified above.	Rs. 1.93 Lakhs	Tenderer is to indicate

LD will be applicable for worst combination of working equipments. The power consumption of each of above equipment shall be measured at motor terminal. No negative tolerance in power consumption shall be allowed.

11.03

**Items Under Guarantee and Correction**

1.	<b>Capacity &amp; Pressure of the following equipment</b>	<b>Tenderer to Indicate</b>
a)	Pneumatic Conveying Compressor	
	Capacity in Nm <sup>3</sup> /min.	
	Discharge Pressure in kg/cm <sup>2</sup> (g)	
b)	Fluidizing Air Blower (Ash hoppers & Intermediate silos)	
	Capacity in Nm <sup>3</sup> /min.	
	Discharge Pressure in kg/cm <sup>2</sup> (g)	



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c)	Fluidizing Air Blower (Main Silo)	
	Capacity in Nm <sup>3</sup> /min.	
	Discharge Pressure in kg/cm <sup>2</sup> (g)	
d)	Air dryer	
	Capacity in Nm <sup>3</sup> /min.	
	Discharge Pressure in kg/cm <sup>2</sup> (g)	
e)	Cooling water pump	
	Capacity in cum/hr	
	Discharge Pressure in kg/cm <sup>2</sup> (g)	
2.	Rated ash evacuation capacity of each stream from Hoppers to intermediate silos line (t/h)	
3.	Rated ash conveying capacity of each stream from intermediate silos to main silos (t/h)	
4.	Temperature of the fluidizing air at the outlet of air heaters, deg.C	
5.	Maximum air temperature at outlet of air dryer, deg.C	
6.	Dust content at vent filter outlet at fly ash silo in mg/Nm <sup>3</sup>	
7.	Noise level for all equipment, dBA	

The plant & equipment after erection shall broadly be tested as per stipulation of respective technical specification. However, the detail procedures of demonstration of Performance Guarantee Test shall be furnished by the Tenderer for approval of Purchaser/ Consultant.

After erection is completed visual inspection will be jointly made by the tenderer, supplier and the purchaser. The defects or short comings found during visual inspection shall be rectified by the tenderer.

All required tests shall be carried out as per relevant IS codes or any International standards / codes after erection and any defect found shall be rectified by the tenderer.

Insulation of all the electrical equipment shall be tested with suitable instrument and any defect found shall be rectified by the tenderer.



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The tenderer is to provide and install all measuring instruments required for checking the guaranteed performance which shall not be included among the permanent measuring instruments of the system / sub-system. Such instruments shall be furnished by the tenderer on a temporary basis for the duration of the performance guarantee tests.

The followings are to be checked before putting the plant & equipment on load test:

- a) The satisfactory operation of each plant & equipment along with electrics and C & I.
- b) The correctness of all circuits & interlocks and sequence of operation.
- c) The satisfactory operation of all protective devices.
- d) The satisfactory operation of all rotating equipments, each motion of the crane, etc.
- e) The compliance of the plant & equipment with the specified performance requirement.

Any defects / short coming found during inspection, tests & final run of the plant & equipment as per the above items and other items of guaranteed performance as described in the respective chapters/ parts of the technical specification and not covered under clause 11.03 above will be rectified, restored and demonstrated as per the guaranteed values of performance before final take over and at no extra cost to purchaser.

- The allowable tolerances shall be as per the agreed applicable code or as specified in the specification.
- Should the performance test results deviate from the guaranteed values furnished by the Tenderer in the Schedule of Guarantee including the specified tolerances, the Tenderer shall correct the equipment at no extra cost to the Purchaser and repeat the performance test within a reasonable period as per Volume-I. The Tenderer shall make visibly every effort practicable to correct the deficiencies before any settlement is considered by the Purchaser. If still the Tenderer fails to meet the guaranteed values, the Purchaser shall apply the stipulation of Volume-I.



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- 11.04 Liquidated Damage due to non-fulfillment of time schedule:
- In case the tenderer fails to adhere to the time specified in the technical specification then Liquidated Damage shall be applied as per stipulation of Volume-I.
- 11.05 The total liability for delay and non-fulfillment of performance guarantee values:-
- The Liquidated Damage for delay in commissioning and non-fulfillment of performance guaranteed values are independent and shall be applied / levied separately. However, the total liability of the tenderer towards delay and non-fulfillment of performance guaranteed values shall be as volume-I of this tender specification.
- 11.06 All plant and equipment designed, supplied and installed by the contractor in accordance with TS will be guaranteed for design, materials, workmanship and satisfactory performance as required in the specification and in accordance with the relevance clauses of the Volume-I. The guarantee will include all design work, manufacture, demonstration of performance of each equipment., its component and its system including electrics and instrumentation for their rating / output as well as for the integrated operation of all the equipment included in the scope of supply.
- 11.07 On completion of satisfactory commissioning the Contractor will conduct performance / acceptance tests on equipment supplied to demonstrate that each equipment integral with other systems are capable of achieving the performance guarantee parameters.
- 11.08 The PG test will be conducted over said period of 72 hours after stable operating condition are continuously achieved. When test conditions differ from design conditions, suitable correction will be applied. During this period, the plant will run at rated capacity and observation of the various parameters will be taken at regular intervals to demonstrate the guaranteed performance of each equipment and the plant as whole.



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- 11.09 Instruments, gauges etc. installed for normal operation of equipment / system will be used during the acceptance test as far as practicable. If additional instruments are required for the tests, these will be brought by Contractors free of cost and will be taken back after performance test.
- 11.06 Availability Requirements
- A. The equipment under this contract shall be designed for maximum reliability, availability, and maintainability.
- B. All equipment and system shall be of proven design, using materials which have well established physical and chemical properties and as appropriate to the service intended.
- C. The equipment under this contract shall be designed for smooth and trouble free operation without causing excessive vibration, erosion, corrosion, distortion, taking into account the type of ash for the proposed station.
- D. To ensure high reliability of the trip circuit and to avoid spurious tripping of the unit, multiple logic system shall be provided for important and vital trip functions.
- E. All standby units shall be designed for auto start up on tripping / failure of running units.
- F. Adequate maintenance facilities shall be provided as required for assembly, disassembly, alignment work, etc. to facilitate quick maintenance work.
- G. The availability of plant & system shall not be less than 100% and the same has to be guaranteed.