



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



**03.00 INSTRUCTIONS TO BIDDERS AND DESIGN BASIS**

**03.01 GENERAL**

The new dry fly ash handling system (collection and disposal system) covered in this specification is to be installed in Tenughat Thermal Power Station (TTPS) of TVNL. TTPS consists of 2 x 210 MW capacity coal fired power plant units.

Fly ash is collected in economiser hoppers, gas duct hoppers, air preheater (APH) hoppers, ESP hoppers and stack hoppers.

At present, units are fitted with hydro ejectors for handling the fly ash. The fly ash generated in all the two units is collected and conveyed under vacuum created by the hydro vectors and then disposed off in slurry form to the nearby ash pond.

However, as per the latest guidelines of the Government of India, the fly ash collection and disposal has to be done in dry form to reduce environmental hazards and to encourage secondary use of the fly ash in manufacturing bricks, cement, etc.

In view of the above, Dry Fly Ash Handling System with all its accessories are to be installed in all the two units (2 x 210 MW) of TTPS without replacing / affecting the performance of existing hydro ejector based vacuum type Ash Handling System. It has been envisaged that with the help of inverted Y type / adapter connection to hoppers and branch isolation valves, existing hydro ejectors will be isolated from the circuit.

The proposed new dry fly ash collection and disposal system along with all its auxiliaries and accessories shall be supplied along with electrics and Control & Instrumentations in line with the requirement laid down in this specification and to make the entire system complete in all respect. Ensuring completeness of the system shall be the Bidder's responsibility. The design of the proposed ash handling system should be such that it can meet the stringent statutory pollution control regulations of CPCB & SPCB and be capable to handle the excess ash generation from ESP & other flue gas hoppers to restrict the dust emission to atmosphere less than 50 mg/nm<sup>3</sup>. Bidder must design all the systems & indicate clearly the margin provided in the systems to handle the excess ash.



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All associated facilities / systems such as compressed air system, blower system, piping, silo system, etc. will be designed & supplied accordingly. The proposed system shall also to be integrated with all the existing main systems and shall be constructed, installed and commissioned so as to make one complete system for smooth, efficient, safe and trouble free operation. All fittings, accessories, valves, etc as required for interconnection / integration with the existing systems shall be within the scope of work and supply of the Tenderer.

03.01.01 Purpose of the proposed new dry fly ash handling system covered under this specification is to convey the fly ash generated in the steam generators of unit # 1 & 2 in dry form from power plant area to intermediate silos and then to main silos, storage the ash in main silos and finally to dispose off the fly ash in dry / moist form continuously round the clock.

03.01.02 The proposed new Ash handling system shall be provided for collection and disposal of fly ash from all the two (2) units. The system will be consisting of the following basic sub-systems:

- a) Dense phase pneumatic conveying of fly ash from boilers hoppers and ESP hoppers of unit # 1 & 2 to intermediate fly ash silo(s) made of RCC.
- b) Dense phase pneumatic conveying of fly ash from intermediate silos to main silo(s) made of RCC.
- c) Direct unloading of dry ash from main silos into closed tankers or open trucks / dumpers through different openings (minimum four numbers for each silo) of the silos.

03.01.03 Tenderer, if desires, may suggest an alternative proposal for a better system for review of the purchaser / consultant. Acceptance of the alternate proposal shall be the discretion of the purchaser.

**03.02 Codes and standard**

03.02.01 All equipments, system and works covered under this specification shall comply with all latest statutory regulations and safety codes as applicable in the locality where the equipment shall be installed.

03.02.02 All requirements of Indian or equivalent international standards shall be adhered to. In the event of any conflict between the



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requirements of the equivalent codes and standards, the later shall govern unless specified otherwise in the specifications.

- 03.02.03 All electrical equipments supplied shall comply with the latest revision of the Indian Electricity (supply) Act, Indian Electricity Rules, Indian Standards (IS) or International Electric Technical Commission (IEC) Publication and also within the statutory requirements of the Government of Jharkhand as regards safety, earthing and other provisions specified therein for installation and operation of electrical equipment.
- 03.02.04 The design in general for all foundations, civil & structural works and facilities shall conform to the latest Indian Code of Practice or recommendations of the standard civil specifications .The design of structural steel work shall conform to the relevant latest Indian Code of Practice or recommendations of standard structural steel specification.
- 03.02.05 It shall be the responsibility of the Bidder to obtain the necessary approval of the concerned Inspecting Authority for the design and design calculations, manufacturing and erection procedure. Necessary statutory fees for the same have to be paid by the Bidder till commissioning of the plant.
- 03.02.06 Design not meeting the above stipulations of the codes and standards shall not be acceptable.
- 03.02.07 During execution of the proposed facilities such as water pipe line, power line, gas pipe line, structure and trestle foundations for the overhead structures, building, etc., if found fouling with any under ground existing facilities, the existing facilities or the proposed facilities shall be suitably diverted / rerouted by the Contractor subject to approval of the purchaser.

03.02.08 **Design**

The design, manufacture and performance of the equipment shall comply with the requirements of all applicable codes of IS / BS / ANSI / DIN. All the referred codes shall be of latest version. Some of the applicable codes are indicated below.

IS : 2825 : Unfired pressure vessels

ASME Section VIII : Unfired pressure vessels



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IS : 7938	:	Air Receivers for Compressed Air Station.
IS-5456 (1990)	:	Code of practice for testing of positive Displacement Type air compressors and exhausters
IS : 778	:	Gun metal gate, globe and check valves for General Purpose
IS: 780	:	Sluice valves for water work purposes (50 to 300 mm)
IS: 2906	:	Sluice valves for water works purposes (350 to 1200 mm)
IS: 5312	:	Swing check reflex ( non return valves)
IS : 4503	:	Shell and Tube Heat Exchanger
IS : 3589	:	ERW Steel Pipes (for 150 to 2000 mm NB)
IS : 1239	:	MS Black pipes/ GI pipes
IS : 2002	:	Boiler quality plates
IS : 5312	:	Swing check type reflux valves
IS : 6392	:	Steel pipe flanges
IS : 3042	:	Sluice gates
IS : 1703	:	Ball valves including floats
IS : 2906	:	Sluice valves (for 350 to 1200 mm NB)
IS : 4038	:	Float valves
IS : 1043(Part – I)	:	Measurement of air flow
ANSI B1.1	:	Bolting
ANSI B31.3	:	Code for piping
ANSI B16.5	:	Steel pipe flanges
ANSI B16.9	:	Steel pipe flanges / flanged fittings
ANSI B16.10	:	Dimensions of ferrous valves
ANSI B 16.11	:	Forged steel fittings
ANSI B16.25	:	Butt welding ends
ANSI B16.34	:	Steel valves, flanged and butt welded ends
ANSI B36.1	:	Welded and seamless steel pipes
ANSI B36.20	:	Black and hot dipped zinc coated And seamless steel pipes
API 615	:	Sound control of mechanical equipment
API 614	:	Lubrication, shaft sealing & control oil



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	:	system
API 617 / 672	:	Centrifugal compressors
API 670	:	Non-contacting vibration and axial position Monitoring system
ASME PTC 10	:	Performance tests of centrifugal compressors
ASTM A53	:	Welded and seamless steel pipes
ASTM A 105	:	Flanges, fittings, valves – forged carbon steel
ASTM A216	:	Carbon steel castings
ASTM A234	:	Carbon steel and alloy steel welded fittings
BS – 1571, Part I and Part II	:	Testing of positive displacement compressors and exhausters