



TECHNICAL ENQUIRY SPECIFICATION
for
Coal Handling Plant Conveyor System



SAGARDIGHI THERMAL POWER PROJECT
1 x 660 MW UNIT NO. 5, PHASE – III
WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED

BHEL- ISG, BANGALORE 	Coal Handling Plant for 1X660 MW WBPDC, Sagardighi TPP Technical Enquiry Specification for Coal Handling Plant – Conveyor System	Specification Number IS-4-EQ-724-100-M002
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LIST OF ENCLOSURES:

Following enclosures is an integral part of this technical enquiry and must be signed and stamped and submitted along with the offer:

001- ANNEXURE-1- WBPDC TENDER SPECIFICATION

002- ANNEXURE-2– WBPDC AMENDMENT & CLARIFICATIONS

003- ANNEXURE-3– BHEL ELECTRICAL SPECIFICATION.

004- ANNEXURE-4 – DRAWINGS FOR TENDER PURPOSE

Plot Plan with Drawing Number PE_DG_445_100_M001_P0, and

Coal Flow Diagram Drawing Number IS-DG-445-100-A001 R-0.

Tentative Conveyor Profiles (For Tender Purpose)

005- ANNEXURE-5 - BHEL HSE Manual (16 Pages) & PPE MANUAL (142 Pages)

006- ANNEXURE-6- WBPDC Vendor list

007- ANNEXURE-7- Datasheet to be filled by bidder & to be submitted with bid

008- ANNEXURE-8- LIST OF MANDATORY SPARES (IN BIDDER'S SCOPE)

009- ANNEXURE-9- DRAWING SUBMISSION SCHEDULE

010- ANNEXURE-10- IMPORTANT FORMATS TO BE FOLLOWED

011- ANNEXURE-11- SCOPE MATRIX (MECHANICAL & CIVIL)

012- ANNEXURE-12- STORAGE & PACKING INSTRUCTION

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01.00.00 PROJECT INFORMATION:

Sagardighi Thermal Power Station, Phase-III, comprising of a single extension Unit of 660 MW capacity of Super Critical technology is being implemented by The West Bengal Power Development Corporation Limited in Murshidabad district, West Bengal, India. This Power Station will generate electricity and feed into the West Bengal Transmission Grid to meet the power demand in West Bengal.

1	Project Name:	1x660 MW Sagardighi Thermal Power Station Extn. Unit-5 Stage-III
2	Owner:	West Bengal Power Development Corporation Limited (WBPDCCL), Bidyut Unnayan Bhaban, LA-3/C, Block-LA, Sector – III, Salt Lake City, Kolkata – 700 098
3	Consultant:	M/s. Development Consultant Pvt. Ltd. Block No. DG-4, Sector-II, Saltlake City, Kolkata - 700091
4	Project Location:	Sagardighi Thermal Power Station site is located at Manigram village, 13 KM north of Sagardighi town by the side of the SMGR (Sagardighi-Manigram-Gankar-Raghunathganj) Road at a distance 20 KM from National Highway 34 in Murshidabad District, West Bengal and around 240 KM from Kolkata, India. The nearest rail station is Manigram adjacent to the site on Bandel - Barhawara branch line and 6.5 KM from Sagardighi Railway Station on Sainthia - Azimgunj line of Eastern Railway.
5	Altitude	34M above MSL
6	Approach:	Via Road, Railway, 20 km from National Highway (NH-34)
7	Access by – nearest railway station	Manigram railway station on Bandel-Barhawara branch line 1 km from site.
8	Nearest Airport	Kolkata
9	Nearest sea port	Haldia
10	Availability of Land	Within existing plant boundary of WBPDCCL.
11	Design ambient dry bulb temperature	Maximum 50°C Minimum 5°C
12	Highest wet bulb temp	Maximum 26.9°C
13	Seismic zone	Zone-III as per IS-1893 latest edition.
14	Relative Humidity	73% (avg) to 84% (max)
15	Rainfall - Annual average	1389 mm
16	Latitude and Longitude	24° 22' 13.7" N, 88° 6' 15.8" E
17	Wind Load	In accordance with IS-875 for a basic wind speed of 47 m/sec, up to a height of 10 metres above mean ground level.

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02.00.00 BROAD SCOPE OF CONVEYOR PACKAGE BIDDER:

The scope for CHP conveyor package, vendor shall include design, detail engineering, submission of engineering & civil assignment drawing/ doc. / datasheets/ QAPs/ FQPs, getting approval from customer, manufacturing/ fabrication, inspection/ shop floor testing, shop floor painting, packing, supply, transportation to site in proper packing, receipt & unloading at site, Construction of Open storage yard and closed storage shed, shifting to storage, preservation & security at site, shifting to erection work place, erection, Filling of the Consumables till Handing Over, Trial Run, Commissioning, Functional Testing, O&M before handing over, Performance Guarantee Testing of total conveyor system (except machines which are not in bidder's scope) and handing over to customer (WBPDC).

The following Main Equipment with Associated Accessories are under Bidder's Scope of Supply and Work.

SLNO	DESCRIPTION	QTY	UNIT
1	Conveyor System as per layout and technical specification complete with necessary supporting structure, platforms, idlers, pulleys, fixed trippers, take-ups, conveyor belting, motors, gear-boxes, couplings, direct hydraulic drive unit, hold-backs, brakes(if required), hopper and chutes, flap gates, skirt boards, deck plates, belt cleaning devices, pull chord switches, belt sway switches, zero speed switches, crossovers and LPBS, electricals etc. as applicable and other necessary units/accessories for completing the system including E&C of Belting-1400 mm for BCN-29A/B, 30A/B, 31A/B, 32A/B, 33A/B, 34A/B, 35A/B and 36A/B.	1	Lot
2	Conveyor System as per layout and technical specification complete with necessary supporting structure, platforms, idlers, pulleys, fixed trippers, take-ups, conveyor belting, motors, gear-boxes, couplings, direct hydraulic drive unit, hold-backs, brakes(if required), hopper and chutes, flap gates, skirt boards, deck plates, belt cleaning devices, pull chord switches, belt sway switches, zero speed switches, crossovers and LPBS, electricals etc. as applicable and other necessary units/accessories for completing the system including E&C of Belting-1600 mm for BCN-23A/B, 24A/B and 25A/B.	1	Lot
3	Hydraulic drive for all conveyors including power pack, piping, field instruments, all consumables, hydraulic oil, hydraulic motors, cylinders, electrical motors (LT & HT), electrical accessories, field instruments, JB's, controller unit etc. as per technical specifications. Each set contains two units for running Conveyor Stream A and B separately.	22	Nos
4	Flap Gate pneumatically operated positioner type (for speed regulation) to be installed in various TPs including limit switches and electricals as per technical specifications (excluding travelling tripper where flap gates are motorized). Two (02) nos additional actuator are to be considered for existing flapgate of TP-19.	1	Lot
5	Rack & Pinion Gate including limit switches and electricals as per technical specifications	3	Set
6	Rod Gate including limit switches and as per technical specifications	3	Set



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SLNO	DESCRIPTION	QTY	UNIT
7	Roller screens with drive unit with supporting structure including electricals as per technical specifications	3	Set
8	Ring Granulator type Crusher including electricals, etc as per technical specifications	3	Set
9	Base frame, foundation bolts, base plate, shim plate etc. for Roller Screen, Ring Granulator & its drive equipments	6	Set
10	Fluid coupling (Air-cooled type) for ring granulator as per technical specifications	3	Nos.
11	Vibration Isolation system for crushers (GERB) as per technical spec.	3	Set
12	In line Magnetic Separator complete with tramp iron chutes, bins, hoods for enclosing separators etc. including electricals as per technical spec.	4	Nos.
13	Metal Detector including electricals as per technical spec.	4	Nos.
14	Suspended magnet complete with electric trolley and supporting and handling arrangement including electricals as per technical specifications	2	Nos.
15	Belt Weigher (1400BW) complete with indicators, recorders etc, including electricals as per technical specifications	2	Set
16	Belt Weigher (1600BW) complete with indicators, recorders etc, including electricals as per technical specifications	2	Set
17	Belt Feeder 1800mm - belt width with supply of belt and drive unit complete with necessary supporting structure, belting, idlers, pulleys, take-ups, motors, gear-boxes, couplings, hold-backs, brakes if required, hopper and chutes, skirt boards, deck plates, belt cleaning devices, pull chord switches, belt sway switches, zero speed switches, crossovers and LPBS, electricals etc. as applicable and other necessary units/accessories as per technical specifications.	3	Set
18	All transfer chutes with all necessary supporting structure, liners, hood for all transfer points of unit-V phase-III (Viz. TP-19 to TP-28), Crusher House, Wagon Tippler Complex, Boiler Bunker top, All Inter-connecting chute (along with liners). Stone picking arrangement with chute, Separate tramp iron chute upto ground level with associated structures and bins for magnetic separators. Debris chute in TPs and Crusher House buildings.	1	Lot
19	Chute Vibrator including electricals as per technical spec	1	Lot
20	Chute block switch including electrics as per technical spec	1	Lot
21	Coal Sampling Units including electricals as per technical specifications	2	Set
22	Travelling tripper with flap Gates (Motorized) with actuator, two way chute including electricals as per technical specifications	2	Set
23	Bunker sealing arrangement with belt and supporting structures as per Technical specification	1	Lot
24	Travelling tripper rails, rail fixtures, clamps etc. as per technical specification.	1	Lot
25	Electric, Manual Hoist and chain pulley block including electricals for complete CHP areas including all TPs, Crusher House, Wagon Tippler complex, Pent House, Pump House as per technical specifications. Supply and E&C of monorail for bunker floor is in bidder's scope.	1	Lot

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SLNO	DESCRIPTION	QTY	UNIT
26	Passenger cum goods elevator, Rack and Pinion Type, 1000 Kg in TP-21 and 2000 Kg in Crusher house with structures, guides, all electrics, I&C drives, panels as per Technical specification	2	Set
27	Dust Extraction System. including electricals as per Technical specification	1	Lot
28	Ventilation System for Wagon Tippler underground complex and connecting conveyor tunnel, MCC rooms, Dozer shed including connecting office rooms, toilet etc with electricals as per Technical specification	1	Lot
29	Plain water and dry-fog type dust suppression system for complete Coal handling System area including all TPs, CRH, all conveyors, Wagon Tippler Complex, Wagon Tippler Pre-wetting areas etc.	1	Lot
30	Potable Water, Service water system for complete Coal handling System (including MCCs and Dozer Shed).	1	Lot
31	Service/instrument air system for supply of air required for Flapgate, DE & DFDS system. Additional tap points shall be considered in each TPs for cleaning purpose.	1	Lot
32	Bunker grating as per Technical specification	1	Lot
33	Grating for sump pits at Wagon Tippler complex	1	Lot
34	Air conditioning system for all CHP MCCs as per Technical specification	1	Lot
35	Belt Vulcaniser with complete with splicing tools/kit/ consumables and all accessories -upto1800 mm BW, Hydro-mechanical press type as per Technical specification	1	Set
36	Submersible Sump Pumps with piping, valves, instruments, support complete system including electricals as per Technical specification	4	Set
37	Mandatory spares for Conveyor Package as per spec	1	Lot
38	Maintenance Tools and Tackles as per list enclosed	1	Lot
39	Commissioning Spares as required till completion and handing over of project	1	Lot
40	Electrical Items including all motor, field electrics, limit switches, cables, cable trays, earthing protection material, JBs, LPBS, Local panels, etc as per electrical specification.	1	Lot
41	Construction of open storage yard of minimum 3000 sq. m. and closed storage shed (Min 300 sq. m)	1	Lot
42	Operation & Maintenance (O&M) of equipment till handing over to customer	1	Lot
43	Receipt, storage, erection & commissioning of BHEL supplied free issue items like HT motors for crusher etc.	1	Lot

Note:

- a. ***The WBPDC Technical specification, General Technical Specifications/Requirements, Amendments, and BHEL HSE given with this specification, which shall be read with this technical specification and shall form part of the enquiry. Bidder shall submit a signed copy of BHEL's this Tender Enquiry Specification along with all enclosures as Technical Offer with the Bid without any Deviation.***
- b. ***Complete Detailed Engineering Drawings, Calculations, Selection of Components etc. shall be reviewed by BHEL Engineers and Plant Owner during Detail Engineering.***

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- c. ***Bidder to follow drawing submission schedule as per schedule attached in annexure-9.***
- d. ***Successful Bidder shall take Prior Approval from BHEL while placing the E&C Contract Order for this Package to their Sub-Contractor. BHEL reserves the Right to Disapprove/Reject any such E&C Contractor which BHEL deems not fit for executing E&C of this Contract.***
- e. ***Bidder to quote for this offer considering the Enclosed Plot Plan and Coal Flow diagram provided in Annexure-4.***
- f. ***Bidder shall furnish the Guaranteed Power Consumption in KW for the conveyor system path wise as per specification along with the offer and Complete Drive Schedule. Bidder to note that BHEL has considered/declared the auxiliary power consumption of 6289 KW along the longest path as described in Cl. No. 12.02.00 which is excluding Wagon tippler, Side Arm Charger, Apron Feeder and dribble conveyor. BHEL shall load the price per kW of guaranteed power consumption for any increase on BHEL declared value (i.e. 6289 kW) during price evaluation at the rate of Rs-462,000/-per KW of excess power consumption.***
- g. ***For PRE QUALIFICATION REQUIREMENT bidder is requested to refer contract terms and conditions. Only qualified bidders will be considered for further bid evaluation.***

03.00.00 SYSTEM DESCRIPTION AND SCOPE OF WORK & SERVICES

03.01.00 INTENT OF SPECIFICATION

The package shall be on the basis of single point responsibility, completely covering the following activities and services in respect of all the equipment & works specified and covered under the specifications:

- a. Basic Engineering of the coal handling plant as per WBPDC/ BHEL requirement (preparation of conveyor profile, flow diagrams & layout drawings, preparation of GA drawings/load data drawing for all galleries, junction towers, layout of all buildings related to coal handling system and other detail drawings etc)
- b. Detailed design of all the equipment and equipment system(s) included in bidder's scope. (All general arrangement drawings and equipment/ system drawings along with load data, various schedules/ power calculations etc. as per WBPDC/BHEL requirement)
- c. Providing engineering drawings, civil assignment drawing/ doc. / datasheets/ QAPs/ FQPs, equipment sizing & performance data, instruction manuals, as built drawings and other information.
- d. Responsibility of getting drawing approval from customer is in bidder's scope.
- e. Compliance with statutory requirements and obtaining clearances from statutory authorities, wherever required for all the equipments and systems covered under the scope.
- f. Complete manufacturing including shop testing/ type testing. Bidder to offer all the items/ materials for inspection, by BHEL/ WBPDC/third party as the case may be, prior to dispatch from shop. Necessary approval for drawing/ documents for all item/ equipments from WBPDC/ BHEL shall be obtained by the bidder prior to procurement/ manufacturing. Make approval shall be taken by the bidder from WBPDC for all the items prior to procurement/ manufacturing
- g. Packing and transportation from the manufacturer's works to the site including logistic studies, customs clearance & port clearance, port charges, if any.

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- h. Receipt, storage (Open & Closed), preservation, handling and conservation of equipment at the site.
- i. Fabrication, pre-assembly, if any, transportation within site, erection, testing, commissioning and completion of facilities including putting into satisfactory operation of all the equipment including successful completion of initial operation.
- j. Performance and guarantee tests after successful completion of initial operation
- k. Supply of spares on FOR site basis
- l. Reconciliation with customs authorities, as required
- m. Conclusion of the contract.

The Bidder shall be responsible for providing all material, equipment and service, which are required to fulfill the intent of ensuring operability, maintainability, reliability and complete safety of the complete work covered under scope of work in this specification, irrespective of whether it has been specifically listed herein or not. It is not the intent to specify herein all aspects of design and construction; nevertheless, the equipments shall conform in all aspects to high standard of engineering, design and workmanship and shall be capable of performing in continuous commercial operation in a manner acceptable to WBPDC, who will interpret the meaning of the specification and drawings and shall have a right to reject or accept any work or material which in his assessment is not complete to meet the requirements of this specification and/or applicable to Indian/ International standards mentioned elsewhere in this specification.

Bidders shall submit the offer strictly in line with the technical specifications and instructions provided in this document. In case the requirements mentioned in these documents are not complied with, the offers may be considered as incomplete and would become liable for rejection.

03.02.00 SCOPE OF WORK

For system description and scope of work and service bidder to consider Customer NIT specification including all amendments and post bid resolutions attached in Annexure-1 & 2.

Bidder also to follow Plot Plan and coal flow diagram prepared by BHEL and attached in annexure-5 of this enquiry specification.

1. Supply of Wagon tippler, Side arm charger, Apron feeder, dribble conveyor civil work of wagon tippler complex is excluded from bidder's scope. However, bidder's scope starts from conveyor system BCN-29A & 29B with all necessary supporting structures, skirt board, all frame work etc. Apron feeder discharge chute has to be provided from bottom of Apron feeder floor to the conveyors. Hoist for apron feeder, BCN-29A/B tail pulley, sump pumps etc. for WT complex are in bidder's scope. Ventilation system, Dust extraction/suppression system for complete WT complex are in bidder's scope.
2. Bidder's work also starts from proposed conveyor system 23A & 23B with all necessary supporting structures, skirt board, all frame work etc. in existing TP-19 building of Phase-II by providing necessary chute work from bottom of existing flapgate. Supply of two (02) nos pneumatic actuator with necessary piping, supports, limit switch, electrical, E&C for existing two (2) nos flapgate in TP-19 is in bidder's scope.

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3. Civil & Structural works of all WT Houses, Trestles, Galleries, TPs, Crusher Houses, MCC Buildings, Pump/compressor house, tunnels, are excluded from bidder's scope. However all mechanical work with necessary support structures are in bidder's scope. Also bidder shall prepare and furnish their mechanical GA drgs., civil assignment drgs./ load data drgs. indicating sizes, equipment load details etc. and other input and do the grouting of equipments, minor chipping as mentioned above scope.
4. Power requirement and belt tensions for belt conveying system shall be designed based on CEMA -latest edition.
5. **Structural steel to be used by bidder for this package shall conform to Grade E350 / E250 of quality (A/BR/B0), Semi killed / killed as per IS: 2062 (latest) for rolled steel members or plates. All structural steel plates and sections shall be either of "SAIL" or "TATA STEEL" or "RINL" or "JINDAL" make or vendor approved by WBPDC.**
6. Electrical scope of work will be as per Annexure-3. Electrical load details shall be furnished within one month from date of LOI.
7. FGL for Railway Merry go round is to be considered as 34.0 M.
8. Bidder should consider variety of belt as follows:
 - (1) One type for uncrushed coal of 1400mm belt width.
 - (2) Two type for crushed coal of 1400mm belt width.
 - (3) One type for 1600 mm belt width
9. All Belt Protection Switches are in bidder's scope.
10. Electrical motors for hydraulic power pack shall be dispatched by fitted with power pack only. Power packs functional test shall be shown to customer by running hydraulic pump with job motor only for showing variation of necessary flow and pressure requirement.
11. Suitable hold back devices for preventing running back of the conveyor belt for all conveyor shall be provided by bidder in case of conveyor being stopped in loaded conditions due to power failure or during normal operational delays shall be provided to give positive protection. It shall be released instantly when 'power' resumes or the 'delay' is removed. The hold-back devices shall be integral with hydraulic drive.
12. **Type of oil cooler for hydraulic power pack is air cooled.**
13. **Gear boxes shall be Bevel Helical type for conveyors to optimize building sizes.**
14. Split bearings of shall be considered for all underground conveyor pulleys and for all discharge pulleys.
15. Stone picking and cross-over arrangements are in bidder's scope. Maintenance platform/ladder/stool piece (if any) required for CHP equipments like hoists, CSU equipments, skirt boards etc shall be provided by bidder.
16. Dust & debris chute shall be provided by bidder in all TPs and crusher house with hinged type galvanized cover and gratings. Opening shall be provided in all working floors. The chute shall be provided upto ground level and erection shall be done by bidder by considering necessary support from main structural members. Any structural steel required for the same are in

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bidder's scope.

17. All the structural work for HGTV shall be bidders' scope for coal handling system.
18. Bidder shall provide VGTU/HGTU consisting of cage ladder, platform, guards, guide post, partition plate, maintenance platform (if any) for entire coal handling plant shall be in bidder's scope.
19. Supply and Erection of monorail in bunker house shall be done by bidder. All necessary chain pulley block hook supply and fixing are in bidder's scope. Test weight for load testing at site for hoists shall be arranged by bidder.
20. **Vibration Isolation System:** Bidder shall provide GA drawings for vibration isolation system along with details analysis report, civil assignment drawings. Liner plate shall be provided all side of crusher deck opening. **Liner chute plate for crusher deck shall be supplied by bidder. Supply and erection of complete vibration isolation system is in bidder's scope. Concreting will be done by BHEL as per VIS vendor drawing.**
21. **Tentative list of hoist** is provided below. Apart from this list if any extra hoists are required/splitting required/change of type required to cover lifting of CHP mechanical equipments as per customer specification the same shall be considered without any cost implication to BHEL.

SR. NO	Type of Hoist	Junction Tower	Location
ELECTRIC AND MANUAL HOIST SCHEDULE			
1	Electric	TP-20	CONV. 23A/B Head Pulley, Drive
2	Manual		TAIL PULLEY FOR CONV. 24A/B
3	Electric	TP-21	CONV. 24A/B Head Pulley, Drive
4	Electric		CONV. 36A/B Head Pulley, Drive
5	Manual		TAIL PULLEY FOR CONV. 25A/B
6	Electric	WT complex	FOR EACH APRON FEEDER DRIVE AND TAIL END
7	Manual		FOR EACH BCN29A/1B TAIL END & SUMP PUMP
8	Electric	Pent House	Suspended Magnet on Conv 29A/B
9	Electric	TP-23	CONV. 29A/B Head Pulley, Drive
10	Manual		TAIL PULLEY FOR CONV. 30A/B
11	Electric	TP-24	CONV. 30A/B Head Pulley, Drive
12	Manual		TAIL PULLEY FOR CONV. 31A/B
13	Electric	CH	BCN 31A Head Pulley, Drive, ILMS
14	Electric		BCN 31B Head Pulley, Drive, ILMS
15	Electric		CR-1,2,3 Maintenance
16	Electric		BELT FEEDER-1, 2 & 3 HEAD END, DRIVE
17	Electric		BELT FEEDER-1, 2 & 3 TAIL END
18	Manual		BCN- 32A & 32B TAIL END
19	Manual		Roller Screen -1, 2 & 3
20	Manual		CSU equipments
21	Electric	TP-25	Covering CONV. 32A/B Head Pulley, Drive
22	Electric		TAIL PULLEY FOR CONV. 33A/B

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SR. NO	Type of Hoist	Junction Tower	Location
23	Electric	TP-26	Covering CONV. 33A/B Head Pulley, Drive
24	Electric		TAIL PULLEY FOR CONV. 34A/B
25	Electric	TP-27	Covering CONV. 34A/B Head Pulley, Drive
26	Electric		TAIL PULLEY FOR CONV. 35A/B
27	Manual		CSU equipments
28	Electric	TP-28	Covering CONV. 34A/B Head Pulley, Drive
29	Electric		TAIL PULLEY FOR CONV. 35A/B
30	Manual		CSU equipments
31	Electric	Bunker Unit-V	BCN 25A/B CONV HEAD PULLEY & DRIVE MAINTAINENCE
32	Manual /electric		TRIPPER DISCHARGE/BEND PULLEY FOR CONV. 25A/B
33	Manual /electric	All VGTU/HGTU	Bend & Take-up Pulley of all conveyors, Counter weights of each conveyors
34	Manual	DH	BCN 9 drive unit at DH
35	Electric	FOR EACH PUMP/COMPRESSOR HOUSE	
36	Manual	All junction tower and crusher house actuator	
MANUAL CHAIN PULLEY BLOCK SCHEDULE			
1	Chain Pulley Block	FOR ALL CONVEYOR	For handling bend in take up towers. Necessary hooks of adequate capacity will be provided at the top of gallery. Additional 2 nos CPB shall be provided as per specification.

22. Complete dust extraction system including compressor at Crusher house and bunkers is included in bidder's scope as per WBPDC specification and flow diagram. Separate DE system shall be considered for Unit-1 & 2 Bunkers. (Compressor motors shall be strictly LT accordingly compressors shall be sized.) Compressor shall have 100% standby with air receivers as required for ventilation system/DE/instrument air for flap-gates system shall be in bidder's scope. Air drier, moisture trap as required for pneumatic flap gate operation shall be in bidder's scope.
23. **Plain Water Dust Suppression System with makeup water system, Dry-Fog DS System, Service Water and Drinking Water system:**
- (1) The entire water system of coal handling plant from Wagon Tippler/TP-19 to boiler bunkers shall be designed so that **both the streams of conveyors and equipment can be run simultaneously** and safely without any problem, in case of emergency operation of the plant.
 - (2) Plain Water Dust Suppression System with makeup water system, Dry-Fog DS System, Service Water and Drinking Water system including pumps, Piping's, Fittings, PRV's, Gauges, Switches, other instrumentations, Valves etc. and with all drives, electrics and control system mentioned elsewhere in the specification for the following,
 - (a) Plain Water Dust Suppression System (for waiting wagons and wagon tippler hopper area as per WBPDC tender specification.
 - (b) Dry Fog Dust Suppression System for Transfer Points of CHP,
 - (c) Service Water System along the conveyor gallery and TPs, crusher houses, MCCs, toilets, bunker floors of CHP, Dozer Shed.

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- (d) Potable Water / Drinking Water System for all CHP area.
- Suitable recirculation arrangement shall be considered to run the pump at low demand.
- (3) Suitable anticorrosive treatment for buried piping shall be considered. All **underground pipes shall be wrap coated**. Earth digging and subsequent filling shall be considered during laying of underground piping by bidder.
- (4) Pipelines with necessary valves, bends, support on pipe rack etc. for incoming water pipes shall be considered by bidder.
- (5) Necessary level switch, level indicator shall be provided for all RCC and overhead tank. Supply of Drinking water storage tank for all TPs and building of CHP is in bidder's scope.
- (6) Necessary field instruments for complete system shall be provided by bidder.
- (7) Supply compressed Air system (Compressors, air receiver) along with piping for entire CHP area for DFDS system and other purpose.
- (a) Supply of Compressors with 100% standby system with after cooler, oil separator and air receiver with drives, electrics and control system mentioned elsewhere in the specification for the Entire CHP area. Supply of motor and other electricals for compressor is in scope of Bidder. If motor rating as per calculation appears in HT range, bidder shall divide the compressor and motor and supply the same in order to keep the motor in LT range.
- (b) Water cooled compressor Cooling system as well as the oil coolers as required should be designed to withstand the maximum pressure of the cooling water circuit i.e. 10 kg / cm² (g). Suitable arrangement for cleaning of the cooling water-jackets during maintenance of compressor (if applicable) shall be provided. Pl. note only clarified water will be provided for cooling (no DM water) hence necessary arrangement shall be considered by bidder.
- (c) Compressor tube material shall be SS304, shell material shall be SA 285 Gr. C or equivalent.
- (d) The inlet and /or outlet silencer for each compressor unit shall be provided such that the noise level requirement as stated below can be complied with: -
- “Maximum noise level shall not exceed 85 dB (A) when measured at 1m away and 1.5m height above ground from noise emission source.
- (e) Required number of air receiver shall be provided.
- (8) All the above to meet as per the enclosed WBPDC NIT Specifications, MOM, amendments, clarifications and design Memorandum attached with the enquiry specification except items / systems which are mentioned in the exclusions list.
- (9) Design of Pump Houses, Preparation of GA Drg. and Civil Assignment Drgs. for Pump Houses, Necessary Civil Input Drgs. i.e. load data drawing shall be the Scope of the Bidder and necessary inputs and Equipment GA Drgs. shall be furnished by the Bidder in Editable Soft Copies.
- (10) All Commissioning and Mandatory Spare Parts required for all equipments under this Specification are in the Bidder's Scope. Commissioning Spares shall be handed over to the Customer as per NIT.
- (11) The List of pumps/compressor shall be decided during detail engineering. For further details refer WBPDC NIT specification.
- (12) Incoming Make-up water header for DS/DFDS, Service Water and potable water shall be taken from existing service water header near pump house-1 for DS/DFDS/SW System (for Phase-II CHP) as mentioned in Plot Plan. Connecting Pipes from the makeup water pipe header to RCC tank including one float valve and one electrically operated butterfly valve shall be provided by bidder. From the tank DS & SW will be distributed to CHP and LHP area as per requirement by the bidder.

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24. Ventilation system shall be provided for underground portion of Transfer points, Wagon Tippler Complex, Conveyor Tunnels and also for CHP Control Rooms, various MCC and Switchgear Rooms, Battery room, Cable spreader room and enclosures of Dry Type Transformers shall be provided with pressurized ventilation system. Bidder has to follow respective customer technical specification for ventilation system for technical details. Ventilation system with axial flow fans are to be provided in CHP area toilets including coal control rooms, MCC rooms, Dozer shed, Pump House and other buildings.
25. Air conditioning system for CHP areas are included in bidder's scope. Main CHP Sub-Station Cum Control room building near crusher house shall be provided with air cooled package type air conditioning unit, precision type, as per Vol-II J2 of WBPDC tender specification. Necessary sizing calculation shall be provided by bidder. Substation building and control room for Wagon Tipplers in other areas as specified in specification, Vol-II J2 of WBPDC tender spec, shall be provided with split type air conditioner.
26. Air conditioning also to be provided in part of MCC room / Cubicles housing Programmable Logic Controllers, (PLC) Panels and other Input / Output (I/O) modules. It should be provided in CSU control room, Dozer Shed office room also.
27. Any other area required for Air conditioning and if as per manufacturer's requirement any Switchgear room requires Air conditioning, the same shall be provided by the bidder.
28. Tramp iron collecting bin shall be provided in ground floor for each tramp iron chutes of suitable size.
29. **The construction of store (open and close) shall be in bidder's scope.** Bidder also has to consider proper storing of BHEL supplied items in their scope of unloading, storing, in-plant transportation, E&C as per scope of work.
- 03.03.00 **Bidder should indicate "Operation & Maintenance charges" per shift in their offer for total 300 shift.** O&M will become effective/ operative only after the successful commissioning of conveyor Package, if felt necessary by BHEL. The O&M Charges are payable only with certification by BHEL's Resident manager. The payment will be done on actual usage on monthly basis as per contract. The quoted rate shall be valid for a period of 2 Years after commissioning / Handing Over. (Please refer O&M scope & manpower details described in this specification, Clause No-6.00.00)
- 03.04.00 **3D Modelling Work of Coal Handling System**
 3D model of complete CHP including all civil structure/TPs, buildings conveyor galleries, all mechanical equipments, piping (>50mm), electrical equipment, HVAC associated with coal handling system shall be prepared in Aveva PDMS or Intergraph Smart Plant 3D software. The model shall be provided in following format:
- Smart 3D models published in ZVF and XML format.
 - PDMS models published to RVM and ATT format.
- Vendor shall provide delivery date of sequential completion of 3D modelling work with submission of project schedule.
- The price of 2D AutoCAD drgs and 3D PDMS shall be deemed to have been included in the total bid price.**

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03.05.00 SUB- QUALIFICATION REQUIREMENT

Bidder to note that following sub-Qualification requirements to be met and clearance to be taken from BHEL/WBPDC before placement of order on sub-vendors:

a) Dry-Fog Dust Suppression System:

Bidder/ its Sub-vendor shall source Dry-Fog Dust Suppression System from a manufacturer/ supplier who has engineered and supplied minimum one (1) number of Dry Fog Dust suppression system including all associated electrical/ instrumentation and works in a material handling plant with conveyor capacity not less than **1000 TPH (or) belt width not less than 1000mm** and have been in successful operation for at least one (1) year prior to the date of Techno-Commercial bid opening for this package.

b) Ring Granulator Crushers:

Successful Bidder shall source Ring Granulator type crushers from manufacturer/supplier who has supplied minimum one (1) no. Ring Granulator type Crusher of at least 1000TPH capacity for crushing coal or other minerals of equivalent volumetric capacity which should be in successful operation for a minimum period of two years as on techno-commercial bid opening date for this package.

c) Roller Screen:

Successful Bidder shall source Roller Screen from manufacturer/ supplier who has supplied minimum one (1) no. Roller Screen of at least 1000TPH capacity for handling coal which should be in successful operation for a minimum period of two years as on techno-commercial bid opening date for this package.

03.06.00 DOCUMENTS / INFORMATION TO BE FURNISHED ALONGWITH TECHNICAL OFFER:

- a) Bidder shall sign and stamp all the pages and submit Tender Enquiry Specification along with all enclosures as Technical Offer with the Bid without any Deviation.
- b) Confirmation on Scope of supply in line with Tender.
- c) Detailed Project Schedule
- d) Bidder to also submit tentative list of complete equipment schedule (Type, Rating). However, it shall be finalized during detailed engineering.
- e) The bidder shall indicate the FOR site prices of each and every item of Mandatory spares as per the annexure-8 in the relevant price format.
- f) The bidder shall furnish the list of recommended spares for 3 years of normal operation of the plant and indicate the list and total FOR site price in relevant price format.
- g) Data sheets duly filled by the vendor (Annexure-7).
- h) Bidder shall furnish the list of all drawing/documents submission schedule in line with the list attached in Annexure-9
- i) Catalogues/ Leaflets of respective equipments.
- j) List of field devices including Type, Rating and Duty.
- k) Electrical Load list/Feeder list with type/rating/power requirement.
- l) Signed & stamped un-priced format Copy.

04.00.00 TERMINAL POINTS:

Coal Handling Plant (CHP) scope starts from discharge end of the Apron feeder at Wagon Tippler complex and discharge end of flap gate at transfer tower-19 and ends at the last bunker tripper through conveyor 25A/25B.

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05.00.00 ADDITIONAL NOTES FOR CONVEYOR PACKAGE (MECHANICAL SCOPE OF WORK)

General Notes:

- 05.01.00 The length of conveyors shall be generally as per the latest Plot plan furnished to bidder with the enquiry specification. These are indicative and for the guidance of the bidders. The same shall be improved upon by Bidder during detailed engineering. There shall not be any price implication for any variation in the upto $\pm 1\%$ of total length and any lift of the conveyors during detailed engineering.
- 05.02.00 In case of any ambiguity, conflict in the standard & specification and/or interpretation of clauses in this enquiry spec. and its enclosures the decision of BHEL shall be final and binding and any change due to this shall have no price implication on BHEL and shall have to be absorbed by successful bidder.
- 05.03.00 Bidder shall strictly follow and adhere to the guidelines laid down in the enclosed BHEL's health, safety and Environment manual.
- 05.04.00 Bidder shall visit the Site to familiarize with the Coal Handling system and site constraints before submitting the complete offer to BHEL in all respects. No issues arising out of site condition or layout constraints shall be entertained later on during detail engineering and any modification required due to site condition or layout constraints shall be done by successful bidder without any cost implication to BHEL.
- 05.05.00 **Preparation of GA drawings for the complete coal handling system are included in bidder's scope** as per WBPDC mechanical/electrical/civil NIT specification. Bidder shall submit the civil assignments drawings indicating all the load data insert details, openings etc. Bidder shall ensure the correctness of civil assignment drgs which shall be an input for BHEL's civil design agency & structural design package bidder. Any issues like cutting/chipping of floors, beams shall not be permitted. Any additional civil works arising if missed out things in civil assignment drg prepared by the bidder like pedestal, foundation etc. shall have to be taken care by package bidders without any cost implication to BHEL and engaging its own resources.
- 05.06.00 Construction work approval and necessary certificate for building and other construction workers shall be obtained from factory inspector/the Govt. Agencies by bidder. WBPDC/BHEL will assist for obtaining such certificate.
- 05.07.00 Bidder shall engage a qualified civil engineer with min 3 year site experience to supervise the correct implementation of their civil assignment drgs. prepared for their machines and correctness of civil and structural works at site in order to suit the civil & structural works for equipment erection as civil works to be done by BHEL's civil and structural contractor at site during construction (i.e. pedestal casting, footings, cutouts, pockets, gallery alignment, survey etc.) so that no issues like misalignment, run out of pockets foundations arises, also a joint protocol to be prepared for record. Later on, no claims from bidder shall be entertained that civil pedestal casting, footings, cutouts, pockets etc are not in order or not as per their drg. and if it exist then these shall be rectified by the bidder at their own cost and any delay on account of this shall be attributable to respective package bidders.
- 05.08.00 Supply of grouting cement (GP-2) and grouting of all mechanical equipment/items and its drives base shall be in the respective bidder's scope. BHEL's civil contractors shall provide only the foundation pockets for pedestals (wherever necessary) as per mech. GA drgs of the bidder.

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05.09.00 Bidder shall depute continuously and maintain & depute following minimum nos. of engineers and supervisors, not limited to nos., at site for supervision of E&C, coordination and commercial activity for the package.

- (a) Resident Manager- 1no.
- (b) Mech. Engineer (min 2 yrs. site exp.) or mech. Supervisor (min 5 yrs. exp.)- 2 nos
- (c) Civil & structural Engineer (min 3 yrs. site exp.)- 1 no. for their roll mentioned above
- (d) Elect. Engineer (min 2 yrs. site exp.) or Elect. Supervisor (min 5 yrs. exp.)-1 no.
- (e) Non-engineer- 1no. for Storekeeper and commercial activity.
- (f) Qualified Safety officer – 1 No

In case Bidder fails to maintain the above minimum manpower /site staff at site till project completion, suitable pro-rata deductions shall be made from RAB payables, for the duration of such absences, at the prevailing rate of BHEL manpower cost as penalty at the sole discretion of BHEL whose decision shall be final and binding.

05.10.00 Supply of all insert plates, stools and other embedment in concrete and it's fixing with structural members required for machine erection during erection shall be in scope and done by bidder in coordination with BHEL's civil & structural contractor.

05.11.00 Minor chipping i.e. up to 50mm thk, micro leveling, and providing shim plates for erection of machines equipment / items shall be in the scope of bidder.

05.12.00 Bidder shall be responsible for commissioning of complete coal conveyor system, demonstration of performance guarantee parameters of individual equipments as laid down elsewhere in the specification and support to BHEL's other vendor for integration with Main CHP machines and commissioning of the complete CHP after integration with the machines and other CHP system. Equipments / systems offered by the bidder shall not be accepted for final handover till the demonstration of performance guarantee parameters of the equipments / systems and in case any changes required in conveyor package to match the overall CHP system PG test parameters without affecting other associated system shall have to be done by the bidder without any cost implication to BHEL. All necessary tools and tackles for PG test shall be in bidder scope.

05.13.00 Bidder shall submit the weekly engineering progress reports in BHEL's format and depute full project team for attending all project review meetings called by BHEL and WBPDC (or their consultant) without fail.

05.14.00 Bidder shall strictly adhere to the vendor list as provided by BHEL/WBPDC in Annexure-6 and vol-IIA of WBPDC tender document. Any new vendors proposed or considered by bidder shall be subject to approval of WBPDC/BHEL. In case it is not approved by WBPDC/BHEL then sub-vendors are to be selected from WBPDC/BHEL approved vendor list without any price implication to BHEL.

05.15.00 Bidder to note that time is the essence of this contract, thus they shall submit the submission schedule for the list of drgs indicated in this document in no. of days from zero date i.e. LOI date. No delay shall be entertained later on.

05.16.00 Bidder shall furnish the L-2 project schedule for complete project indicating various milestones and constraints along with the bid. Each successful bidder shall furnish the L-3 project schedule in line with the L-2 schedule after award of the contract. Dates of submission

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of GA drawings and corresponding civil assignment drawings shall be indicated. Requirement of fronts from BHEL for starting the erection activities shall be indicated for achieving the commissioning date.

- 05.17.00 Bidder shall make their own arrangements well in advance for heavy erection equipments like bigger cranes, hydra, winch etc that are required for erection of equipments which are at higher height. List of minimum handling facilities, tools and tackles required at site during erection shall be as mentioned below. For any reason, such facilities are not available, BHEL has the right to arrange the same from other agencies/Customer on hire basis as per the agencies norms and the same shall be recovered / adjusted contractor's subsequent running bill.
- (1) 75/100 Tons crawling crane (02 nos), Hydraulic type mobile crane-01 nos,
 - (2) Trailer-02 nos,
 - (3) 03/05/10 Ton capacity winches in good working condition 1 no each.
 - (4) 10 nos. Other handling equipment like chain pulley blocks etc.
- 05.18.00 Bidder shall consider mandatory spares of all the machines in their scope as mentioned in specification till handing over to customer.
- 05.19.00 Receipt & unloading at site, local transportation, storage, preservation & security, shifting to erection work place, E&C of all free issue items to vendor shall be in bidder's scope.
- 05.20.00 All Material of construction for all equipment shall be subject to WBPDC/BHEL approval during detail engineering.
- 05.21.00 Consumables like lubricants; oils etc for first fill and initial operation with 10% for topping up. Special tools and tackles, as required, commissioning spare parts, Supply & application of rust preventive & paints at shop floor and at site after erection as applicable for the equipment /system shall be in the scope of respective package bidders.
- 05.22.00 Provision of any temporary supports/platforms required for E& C of mech. Equipment /items including structural material shall be in the scope of bidder.
- 05.23.00 All the foundation bolts, hardware, fasteners, gaskets, flushing and first filling of oils, lubricants, cables etc required quantity to be supplied by the bidder.
- 05.24.00 Necessary provisions shall be considered in the equipment/ items/ systems which are in other bidder's scope for integrating with other equipments/ systems/ items which are part of other contractor's scope.
- 05.25.00 Bidder to note that CHP fronts during erection will be given in a staggered manner. So, Bidder has to consider and envisage mobilization of all resources required, including manpower, in a shortest possible time during execution time. For this bidder has to consider advance resource planning so that erection by the successful bidder is not delayed.
- 05.26.00 The coal flow diagram and Plot plan attached with enclosed in this specification are indicative only and doesn't show comprehensive scope of work and actual things may vary during detail engineering.

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- 05.27.00 Bidder shall strictly adhere and follow the erection & commissioning terms and conditions as mentioned in the WBPDC tender specification.
- 05.28.00 All Coupling guards shall be in the scope of bidder's scope.
- 05.29.00 During detail engineering of this package bidder shall strictly adhere to BHEL/WBPDC drawing. Formats, document numbering, QP & FQP formats.
- 05.30.00 **Painting of all the equipment shall be as per specification mentioned in WBPDC general technical requirement VOL-IIA SEC-V, cl.no. 14.00.00 & 15.00.00.**
- 05.31.00 Cleaning of any debris produced by the bidder during E&C shall be done immediately at each front.
- 05.32.00 Rust preventive after inspection at shop floor before dispatch shall be in bidder's scope.
- 05.33.00 The design, manufacture, inspection and testing of the equipments shall comply with all the currently applicable statutes, regulations and safety codes in the locality where the equipment is to be installed and shall also confirm to the latest edition of Indian and other international standards and codes. Nothing in this specification shall be construed to relieve the contractor of the required statutory responsibility. In case of any conflict & ambiguity in the standard to be followed the decision of the customer shall be final and binding.
- 05.34.00 Scope also includes receipt, storage, erection, testing & commissioning of BHEL supplied items i.e. HT motors for crushers and other free supplied items.
- 05.35.00 BHEL will provide construction power at one (1) point. The bidder shall arrange distribution of the same beyond this point at his own cost.
- 05.36.00 The Customer shall not be responsible for any inconvenience or delay caused due to interruption in power supply and no compensation for such failure or delay in works on this account can be claimed by the bidder.
- 05.37.00 The Bidder shall make its own arrangement for alternative source of power supply through deployment of adequate number of DG Sets. (Bidder shall arrange for back-up DG set (without any extra cost to owner) for meeting any eventuality during construction).
- 05.38.00 ELCB's (Earth Leak Circuit Breakers) at all electrical distribution points to be provided and all the electrical appliances shall be connected to them.
- 05.39.00 **Note:**
1. Bidder to note that list above is not exhaustive and any work required completing the system and ensuring its satisfactory running shall also be in the scope of this package bidder.
 2. Bidder shall submit the signed and stamped copy of all the pages which constitutes this technical enquiry specification signed by authorized signatory and clearly mentioning each clause under following two categories to avoid any ambiguity in scope understanding & the scope division as a technical offer during bidding.
 - a. **"accepted without deviation and considered in scope of work"**
 - b. **"Not considered in scope of work".**

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06.00.00 ERECTION, COMMISSIONING AND SUPERVISION

06.01.00 Vendor shall engage qualified Engineers/ supervisors with relevant site experience to supervise & cross-check the correctness/ compatibility of civil & structural works w.r.t E&C of Mechanical systems/ Equipments, E&C of Electrical and C&I Equipment, correct implementation of their civil assignment drgs. prepared by the BHEL/ BHEL's other vendor for the civil works, for their equipment erection at site during construction (i.e. pedestal casting, footings, cutouts, pockets, gallery alignment, survey etc.), so that no issues like misalignment, run out of pockets foundations arises, also a joint protocol to be prepared for record.

- (1) For supervision of Erection & Commissioning, trial run & PG test, handover, Bidder shall depute and maintain minimum two graduate engineers (consists of Mechanical & Electrical) in addition to Site-in-charge and one diploma engineers having requisite relevant experience till handing over of the systems to the customer, as per project requirement & progress.
- (2) Bidder shall depute required manpower for Stores management including one Stores supervisor & security round the clock.
- (3) At least one number qualified graduates for site commercial coordination shall be made available at site for utilizing their services by BHEL, if not complied BHEL will engage directly and recover monthly charges as per commercial part of the enquiry specification.

The same shall be increased as per requirement at site during full-fledged erection. In case of any additional manpower required, bidder shall arrange the same for smooth E&C activities.

Vendor to ensure sufficient manpower throughout the project for parallel engineering, erection and commissioning activities on all equipments, systems etc. Bidder shall depute continuously and maintain minimum no of engineers and supervisors at site for supervision of E&C, coordination and commercial activity for the package.

Electrician employed should possess valid License.

Bidder has to give their organization chart for the site activities along with the offer.

NOTE:

In case Vendor fails to maintain the minimum manpower /site staff at site till project completion, suitable pro-rata deductions as per BHEL prevailing rates, shall be recovered from the vendor.

06.02.00 Open & Closed Storage Yard (Bidder's scope):

1. Bidder to include in their package design & construction of 1 no. semi- permanent store shed for storing his items/ equipments and BHEL free issue items as per his scope of work. The closed store should have brick wall side covering, GI sheet roof covering & rolling shutters & windows as per BHEL's approval. Bidder shall ensure that the size of the closed storage shed is capable of storing heavy equipments required for this package and shall be suitable for movement of hydra. Approx. size of closed store shall be 300sq.m.
2. Bidder to include in their package open storage yard suitable for storing package items and BHEL free issue items if any. Bidder has to do open yard preparation and consolidation of subgrade with power road roller of 8 to 12 MT capacity after excavating earth to an average

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of 15 cm depth, dressing to camber and consolidating with road roller including making good the undulations etc. and re-rolling the sub grade and disposal of surplus earth and leveled with required fencing and security at stores (round the clock). Required concrete sleepers for keeping the equipment & tarpaulin cover to be arranged for outdoor storage of outdoor equipments shall be arranged by bidder.

06.03.00 Customs Clearance

1. The Contractor shall, at its own expense, handle all imported materials and Contractor's Equipment at the point(s) of import and shall handle any formalities for customs clearance, subject to the Employer's obligations under GC Sub-Clause 15.3.2, provided that if applicable laws or regulations require any application or act to be made by or in the name of the Employer, the Employer shall take all necessary steps to comply with such laws or regulations.

06.04.00 GENERAL REQUIREMENTS OF E&C

1. Bidder to note that CHP fronts during erection may be given progressively in a staggered manner. So, Bidder has to consider and envisage mobilization of all resources required, including manpower, in a shortest possible time during execution time. For this bidder has to consider advance resource planning so that erection by the successful bidder is not delayed.
2. Bidder shall make their own arrangements well in advance for heavy erection, equipments like bigger cranes that are required for erection of equipments which are at higher height.
3. **Painting of all equipments/ items which are in bidder's scope at site after erection & commissioning as per painting schedule provided by customer in general technical requirement VOL-IIA SEC-V, cl.no. 14.00.00 & 15.00.00.**
4. Bidder should strictly adhere to the BHEL's HSE manual and comply with these norms during site erection and commissioning.
5. Bidder shall furnish details of Foundation and grouting for machines/ equipments included in this package including BHEL/BHEL's other vendor free issued items.
6. Supply of grouting cement and grouting of all mechanical equipment/ items and its drives base shall be in bidder's scope. BHEL/ BHEL's civil Vendors shall provide only the foundation pockets for pedestals (wherever necessary) as per mech. GA drgs of the bidder and grouting of all mechanical equipment/ items and its drives base shall be in the bidder's scope only.
7. Supply of all insert plates & other embedment in concrete shall be in BHEL's scope.

Bidder to mention the requirement of the same clearly in their respective GA drgs. And it will be erected by BHEL/ BHEL's civil & structural Vendor. If not mentioned in the respective drg. and if any required later stage same will be in the scope of bidder.

Later on, no claims from bidder shall be entertained that civil pedestal casting, footings, cutouts, pockets etc are not in order or not as per their drg. and if it exist then these shall be rectified by the bidder at their own cost and any delay on account of this shall be attributable to respective package bidders.
8. Runner below Conveyor short post will be provided by BHEL.

Interconnections like fixing of stringer post in gallery runner by drilling hole, gas cutting & notches, nut & bolt or by welding shall be in bidder's scope of work.

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9. All conveyors in ground portal and within the buildings shall be supported on the insert plate which is in bidder's scope.
10. Supply of support arrangement structure for flap gate, actuators & chutes in all TP's, & Crusher houses shall be in the scope of bidder.
11. Supply and Fixing Foundation/ anchor bolts for base plates of all conveyors & other equipments (for steel to steel and for steel to concrete) including other necessary items shall be in bidder's scope.
12. Supply of base frame and fixing foundation bolts for all mech. Equipment / items, other related electrical equipments and motors (including BHEL supplied free issue HT motor for crusher) shall be in bidder's scope.
13. Design, Supply, E&C of Ladders, maintenance platforms for hoists, inspection of skirt, poke holes etc. and required supports for the same shall be in bidder scope.
14. Design, supply, E&C of counter weight for all conveyors shall be in bidder's scope.
15. Inter-connection activities like Fixing of stringer post in gallery runner by drilling, gas cutting & notches, nut & bolt or by welding shall be in bidder's scope of work.
16. Minor chipping i.e. up to 50mm thick, micro leveling, and providing shim plates for erection of equipment/items shall be in bidder's scope.
17. Provision of any temporary supports/ platforms required for E&C of Mechanical Equipments/ items shall be in the scope of mech. Bidder.
18. Base frame and fixing/ foundation bolts for all Mechanical Equipments/ items and related electrical equipments and motors shall be in Bidder's scope.
19. Drilling of holes (if any) in the structure of, crusher houses, JT's, Tunnels etc for erection of drives, equipments shall be the bidder's scope.
20. Cleaning of any debris produced by the bidder during E&C shall be done immediately at each front. The bidder should remove all the technical waste in CHP area after each maintenance and operational activities to keep the place clean and according to the satisfaction of BHEL Engineer in charge within 3(three) days after completion of work, failing which BHEL will get the cleaning done at the risk and cost of the bidder.

NOTE:

- (1) All steel structures shall be fabricated in factory, transported and erected at site. All structures shall have bolted field connections.
- (2) Please refer attached File for complete Special Conditions for Erection and Construction Vol-1 Sec-4 from WBPDC. Bidder shall strictly adhere to the same and follow the erection & commissioning terms and conditions as mentioned in the enclosed file.

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06.05.00 FACILITIES TO BE PROVIDED BY THE OWNER

1. Land, free of charge as available for the construction of plant.
2. Construction water at one (1) point shall be made available at a cost of Rs.11/- per KL. Bidder shall install flow meter for measuring the consumption of construction water requirement. All necessary valves, pipes from tap off point upto bidder's utility shall be in bidder's scope.
3. Construction Power will be provided by bidder on chargeable basis. Power supply at one (1) point at 11 kV AC $\pm 10\%$, 3 Ph, 50 Hz. $\pm 5\%$ near the erection site shall be made available. For further distribution, supply of transformer & ACDB / MCC, energy meter shall be in the bidder scope. Any other voltage, if required for any operation during construction, shall be arranged by the Contractor from above source of Power supply.
4. Bidder shall quote, in the price bid, quantity of construction power and commissioning power required by him till first synchronization of the unit.
5. No separate drinking water supply shall be given. Contractor has to arrange the drinking water for own and his sub-contractor /workers at his own cost.

For details erection conditions of contract bidder shall refer WBPDC Lead Specification vol: IIA, WBPDC General Conditions Vol-1: Section-3 and WBPDC Special Conditions for Erection and Construction Vol-1: Section-4.

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07.00.00 OPERATION AND MAINTENANCE TILL HANDING OVER

07.01.00 Scope of Operation & Maintenance (O&M) of the Coal Handling Plant:

1. The Bidder shall be responsible to carry out the “round the clock trouble free operation” of the complete Coal Handling Plant (CHP) related to the unit (1X660MW) for a period of 300 shifts. Each shift shall be of 8 hrs. The time calculation shall be based on the coal feeding to the bunkers while plant is in operation and the shift will not be counted when power plant is not in operation.
2. Prior intimation for start of coal firing shall be given to bidder one or two days before. The above stated 300 shifts shall not be continuous and shall be unequally distributed over a span of 18 months from first coal firing date of the unit. If the equipment is handed over to customer before completion of 300 shifts the bidder will be paid only for the completed shifts on prorata basis. The price quoted shall be valid till the completion of the project.
3. In addition to O&M of the items supplied by the Bidder, he is also responsible to carry out the operation and maintenance of free issue supplied items by BHEL (Excluding O&M of Stacker cum Reclaimer machines, Wagon tippler, SAC & apron feeder, however coordination with machine package vendor for his O&M, is in the scope of the bidder). Maintenance/repair/ replacement of BHEL free issue items supplied to vendor shall also be in the scope of the bidder. However, spare for BHEL free issue items shall be supplied by BHEL.
4. Bidders to note that all consumables/ tools tackles/ manpower required during the period of O & M, shall be included in the scope of Bidder and no additional payment will be made by BHEL in this regard.
5. All other consumables (gasket, rope, diesel, rustoline, waste cloth, lapping paste, jute, emery papers, welding electrodes, grinding wheel, hacksaw-blade, cutting gas, Electric items like Insulation Tape, Lugs, Fuses, Push Buttons, Electrical contact cleaner etc.) required shall be in the scope of the bidder.
6. All tools, tackles, via chain pulley block, pulling & lifting equipment, Trolley, Crane, Hydra, Truck, Trailer, winch, wire rope, grinding machine, sling, D-shackle, Coupler etc. including precision measuring instruments, welding machine & single phase portable welding machine that may be essential to execute the job shall be arranged by the bidder at no extra cost to BHEL. Portable diesel generator machine will have to be arranged by the bidder for carrying out maintenance job outside the plant.
7. For electrical job, Megger (1 no.), Multimeter (02 nos.), Clamp meter (1 no.), Tester and screw driver set (02 nos.), Spanners/Pliers/Small tools kit (1 set)/Crimping tools for power and control cables/ cutter (2 nos.)/ wire stripper (2 nos.)/Blower to be arranged by the bidder at no extra cost to BHEL.
8. Necessary shifting of materials, spares, equipments etc. from store to work site and unserviceable materials from work site to store/yard, is to be done by the bidder at their own cost.
9. The bidder must have adequate resources to undertake routine, preventive maintenance jobs of CHP. They should have adequate resources to mobilize the site for carrying out three to four jobs simultaneously without any delay.
10. Bidder has to compulsorily maintain log book for the O & M staff engaged for O&M jobs and

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submit to Engineer in charge for certification for realization of the bills. After certification of the bill by Engineer in charge of BHEL, bidder shall claim the amount after completion of minimum 100 shifts.

11. Top up of oil/grease/lubricant as required during operation of plant shall be done by the bidder.
12. Housekeeping: Cleaning of all equipment and housekeeping to be carried out dedicatedly in total Coal Handling Plant area and its office premises.
13. All routine, preventive, predictive and breakdown maintenance of equipments of Coal Handling Plant inclusive of BHEL supplied equipments.
14. Fabrication and erection of platform/extra support for CHP area if felt necessary during operation and maintenance of the plant has to be done by the bidder. Materials like channels, beam, angle etc as required shall be supplied by bidder.
15. To maintain the daily Maintenance log book in which details of overhauling / breakdown/maintenance of any equipment including replacement of spares/components to be recorded. Recording of any abnormality of equipments, malfunctioning of system of the CHP also to be noted in the Log book and informed to the Engineer-in-charge of BHEL ISG for initiating immediate corrective action by the vendor.
16. **In case the bidder does not engage required O&M staff with tools/tackles/qualification as specified in the specification, alternate O& M staff shall be engaged by BHEL at their risk and cost on monthly basis for a minimum period of 12 months and amount incurred shall be debited from the bidder's bills.**
17. Issuance of Completion certificate shall not relieve the contractor of maintaining the facility (ies). The facilities are required to be maintained by the Contractor until completion of all the Facilities and hand over of the facilities is affected.
18. In case COD is declared prior to handing over, owner shall take over the O&M responsibilities, however the contractor shall in no way relieved of his liabilities in completion of the facilities including the pending punch list (if any).
19. Subject to GCC Sub clause 27.5, the completion of facilities shall be deemed to have been achieved provided any major facility is not pending for completion as per the contract, either partially or in full, which materially affects the performance of the plant & Equipment.
20. This shall not restrict the contractor to carry out all his outstanding liabilities out of the contract including performance of the Guarantee Test but shall in no way relieve the contractor in completing of all outstanding minor points and pending punch list (if any).

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07.02.00 Minimum Manpower requirement for O&M of the Coal Handling Plant:

Sl. No.	Manpower	Nos.	Remarks
1	Engineer (Mech. /Elect.)	1	General shift
2	Mechanical/Electrical Supervisor	1	In each shift
3	Console Operator	1	In each shift
4	Field Operator	1	In each shift
5	Electrician	1	In each shift
7	Technician /Fitter (Mech.)	1	In each shift
8	Rigger Skilled	1	In each shift
9	Helper	1	In each shift

Note:

- The above list is minimum manpower required for O&M. In case additional manpower required for carrying out O&M, same shall be supplied by the bidder without any extra cost implication to BHEL.
- The vendor shall take approval from Engineer-in charge of BHEL by submitting organization Chart of O&M staff for this site clearly indicating man power deployment with their educational background& experience with supporting documents.
- EPF provisions for the workers shall be made by the bidder as per rule. Relevant documents regarding EPF for the workers of the bidder shall be submitted to the concerned authority before commencement of work.
- The vendor shall be solely and wholly responsible for safety and security of workers engaged in the job and the BHEL property. In case of any accident the vendor shall pay proper compensation to the workers as per workmen's compensation act and repair/replace BHEL property at their own cost & arrangement. The bidder shall also make adequate provision of insurance for their workers at their own cost to cover them against the risk of accident.
- The vendor and their workers engaged in the job shall follow all safety rules at the time of execution of work. It shall be responsibility of the bidder to supply all safety equipment as necessary to its O&M staff.
- The vendor shall comply with all laws, rules & regulations of the land including but not limited to, i) Labour rules & Acts, ii) Factories Act, iii) Minimum wages Act, IV) Payment of Wages Act, v) Bonus Act, vi) EPF rules, vii) Contract Labour (Regulation & Abolition) Act as in vogue or comes into vogue from time to time. BHEL will be kept indemnified against any claim arising out of non-compliance of such Acts/rules.
- The vendor shall not pay less than minimum wages to the workers under the Minimum Wages Act and the Govt. rules made there under subject to revision from time to time. The payment will be made to the workers in presence of the authorized representative of BHEL. The monthly payment is to be made on the 7th day of successive month. The bidder may change the place and time of payment to his workers under intimation to Engineer in charge of BHEL.
- BHEL shall not be responsible in matters of employment of workers engaged in the job at any point of time. The bidder shall be fully responsible for his workers with regard to terms of employment of services. BHEL shall not be held responsible in any manner, whatsoever, in respect of workers engaged by the vendor for carrying out the works at site. Regarding engagement of workers preference should be given towards experienced and competent workers with bonafide testimonials.

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- 9 Beyond general shift if any trouble/breakdown occurs in the plant, Maintenance team must reach the plant without any delay along with Engineer/Site In charge.
- 10 No Person from the list of manpower shall leave the plant site without prior permission from the Engineer in charge of BHEL.
- 11 However, in operation part, if any person is absent, substitute must be given immediately otherwise proportionate deduction will be made.
- 12 The replacement / substitute personnel for maintenance, manpower shall have the same educational qualification and experience.
- 13 If any additional manpower is required during O&M whatsoever under the scope of contract the same shall be made available by bidder in time within the cost. To cater the need of time bound maintenance jobs, the bidder shall depute additional manpower without any cost implication to BHEL.
- 14 During execution of work if any personnel is found not suitable for the job or his presence inside powerhouse premises is felt undesirable, the personnel has to be replaced within 15 days.
- 15 BHEL will not be responsible for payment towards idle labour charges.

07.03.00 Minimum qualification & experience of personnel & manpower required

Sl. No.	Category.	Educational qualification.	Work experience.
01.	Engineer (Mech /Elect.)	Degree / Diploma in Mech. & Elect Engg. from a recognized University/ college.	Min. Two(2) years of work experience for Degree holders and Min. Five (5) years of work experience for Diploma holders in Coal Handling system(wet & dry) and also having a working experience in DCS/PLC based Coal handling system of thermal power plant having unit capacity not less than 210 MW.
02.	Supervisor (Mech. /Elect.)	Diploma in Mech./Elect Engg. from a recognized University.	Min. two (2) years of working experience in Coal Handling system of large thermal power plant of unit capacity not less than 210 MW.
03.	Console Operator.	Degree / Diploma in Mech. & Elect Engg. from a recognized University/ college.	Min. One (1) year of work experience for Degree holders and Min. Three (3) years of work experience in DCS/PLC based Coal handling system of thermal power plant having unit capacity not less than 210 MW.
04.	Field Operators.	ITI (Mech.)/Elect trade institute certificate from recognized institute.	Min. two (2) years of working experience in Coal Handling system of large thermal power plant of unit capacity not less than 210 MW.
05.	Technician/ Fitter(Mech.)	ITI (Mech.) trade institute certificate from recognized institute.	Min. two (2) years of working experience in industry /Coal Handling system



Sl. No.	Category.	Educational qualification.	Work experience.
06.	Rigger	-----	Min. two (2) years of working experience in industry.
07.	Welder	-----	Min. two (2) years of working experience in industry.
08.	Gas cutter	-----	Min. two (2) years of working experience in industry.
09.	Electrician	-----	Min. two(2) years of working experience in Electrical and C&I.
10.	Helper	-----	

NOTE:

In case Vendor fails to maintain the manpower/site staff with above said quantity, qualification and experience at site till the O&M completion, suitable pro-rata deductions as per BHEL prevailing rates, shall be recovered from the vendor.

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08.00.00 TOOLS AND TACKLES

- 08.01.00 The bidder shall furnish a complete and new set of all tools and tackle which are necessary for erection, commissioning, maintenance and overhauling of any of the equipment/ system provided under this specification.
- 08.02.00 Tools shall be shipped in separate containers clearly marked with the name of equipment for which they are intended.
- 08.03.00 The bidder shall furnish an unpriced list of such tools and tackle included under the scope of supply with the technical part of proposal along with price break up for review of Plant Owner/Consultant.
- 08.04.00 Supply of all tools and tackle are included under bidder's scope of work.
- 08.05.00 List showing minimum requirement is furnished below:

Sl.No.	Description	Quantity
1	50 MT & 10 MT Hydraulic Jack	1 no. each
2	4 inch flexible grinder	1 no.
3	Platform trolley for transportation 1 no. of spare parts	2 MT cap.
4	Extendable aluminium ladders	2 nos.
5	10 inch size flat, round, half round	2 nos. bastard/fine files
6	Outside micrometers, range upto 150mm	2 sets
7	Inside micrometers, range upto 150mm	2 sets
8	Vernier calipers	2 nos.
9	Feeler gauges (full set)	2 nos.
10	Universal spirit levels	2 nos.
11	Torque wrenches to suit CHP equipment	2 nos.
12	Standard ring spanners (full range)	4 sets
13	Standard DE spanners (full range)	2 sets
14	Adjustable spanner sets (full range)	2 sets
15	Tabular box spanner sets (full range)	2 sets
16	Socket hood spanner set (box spanner)	2 sets
17	Ball peen hammers (in different sizes)	6 nos.
18	Nylon faced hammers	2 nos.
19	Sledge hammers of 5 Kg. & 10 Kg.	4 nos. each
20	Dial gauges (0-10mm with least count 0.01)	4 nos.
21	Steel tapes (3m, 6m) & steel scales (1m, 0.5m & 0.3m) steel wired tape – 20m	5 sets each
22	Internal and external calipers (0.15m, 0.3m, 0.5m, 1m)	4 sets each
23	Hacksaw frame with one dozen hacksaw blades	2 nos.
24	Tri-square	6 nos.
25	a). Screw operated coupling & bearing pullers: -12" size & 18" size	4 nos. each
26	b). Hydraulic Bearing/Coupling puller: -	10 T cap 1 no.
27	2 MT cap rope pull lift	4 nos.
28	5 MT cap rope pull lift	4 nos.



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Sl.No.	Description	Quantity
29	Oil seal extractors, circlip extractors, bearing extractors	4 nos.
30	Screw drivers of each size	6 sets (6" to 12")
31	Slings with eye bolts and D. shackles	6 nos.
32	Plumb bobs	3 nos.
33	Belt pullers	4 nos.
34	Pliers with insulation covered arm size 7 inch.	6 nos.
35	Adjustable pliers	6 nos.
36	Vice grip (suitable for 2", 6" & 12")	2 sets
37	Three legged tripod stand 10 ft. height	2 nos.
38	Cable jointing kit	2 nos.
39	Marking punches	4 sets
40	Scribers	6 nos.
41	Grease gun	4 nos.
42	Bucket grease gun	4 nos.
43	1/2 inch dia portable wolf drilling machine	2 nos.
44	Avometers	4 nos.
45	Insulator tester-500V	2 nos.
46	Insulator tester -100V	1 no.
47	Vibration Monitor/Metering equipment	2 nos.
48	Tong testers	3 nos.
49	Portable emergency lights	8 nos.
50	Hand lamp sets with flexible wire, 50m each	12 nos.
51	10 MT Chain Pulley Block	1 no.
52	5 MT Chain Pulley Block	2 nos.

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09.00.00 SPARE PARTS

09.01.00 General

1. The Contractor shall indicate and include in his scope of supply all the necessary start-up, commissioning and recommended spares in addition to mandatory spares as specified in the specification. The Owner reserves the right to buy any or all mandatory and recommended spares. The contractor shall also state for each item of spares both mandatory and recommended the normal expected service life.
2. All spares supplied under this contract shall be strictly interchange-able with the parts for which they are intended to replace. The spares shall be treated and packed for long storage under the climatic conditions prevailing at the site, e.g. small items shall be packed in sealed transparent plastic bags with desiccators' packs as necessary.
3. Each spare part shall be clearly marked or labeled on the outside of the packing with the description. When more than one spare part is packed in a single case, a general description of the contents shall be shown on the outside and a detailed list enclosed. All cases, containers and other packages must be suitably marked and numbered for the purpose of identification.
4. All cases, containers or other package are liable to be opened for examination as may be considered necessary by the Engineer.
5. All mandatory and recommended spares shall be delivered to site at least two months before the scheduled date of the trial operation of the plant. However, they shall not be despatched before the despatch of the associated main equipment.
6. All the spares (both recommended and mandatory) shall be manufactured along with the main equipment components as a continuous operation as per same specification and quality plan.
7. The Vendor will provide all the addresses and particulars of his sub suppliers while placing the order on vendors for items/components/equipments covered under the contract and will further ensure with his vendors that BHEL/ WBPDC, if so desires, will have the right to place order for spares directly on them on mutually agreed terms based on offers of such vendors.
8. The Bidder shall guarantee the long term availability of spares for the full life of the equipment covered under the contract. The Bidder shall guarantee that before going out of production of spare parts of the equipment covered under the Contract, he shall give BHEL at least 2 years advance notice so that the latter may order his bulk requirement of spares, if he so desires. The same provision will also be applicable to sub-Vendors. Further, in case of discontinuance of manufacture of any spares by the Bidder and/or his sub vendors, Bidder will provide the two years in advance, with full manufacturing drawings, material specifications and technical information including information on alternative equivalent makes required by the Employer for the purpose of manufacture/ procurement of such items.
9. The bidder to provide datasheets/assembly drawings of the manufacturer/ any other relevant document showing Bill of Material(s), Make, Model Number, Part Number etc. through which the mandatory spares to be supplied can be uniquely identified.

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09.02.00 **Mandatory Spare Parts**

1. The list of mandatory spares which are considered essential by the Owner is indicated in the relevant part of the specification and the Bidder shall include the itemized and total price for all these spares. Where the spares are indicated as a percentage and result in a number plus fraction, the same shall be converted to the near higher whole number.
2. The prices for mandatory spares must be given separately and shall be used for bid evaluation purposes.
3. **List of Mandatory Spares is given in Annexure-8**
4. For all bought out item packages, the contractor shall provide complete material/ component list along with details specification, drawings, component part no. etc. during detailed engineering stage prior to final approval. Such approved document / drawings shall be made available at site (a good number) prior to commencement of erection work. Moreover, such document / drawing shall be provided in soft form (CD).

09.03.00 **Recommended Spares**

1. In addition to the mandatory spares, the Contractor shall also provide a list of recommended spares giving unit prices and total prices for 3 years of normal operation of the plant for spares of indigenous origin, and for 5 years of normal operation for spares of non-indigenous origin. This list shall take into consideration the mandatory spares specified elsewhere in the specification and should be a separate list.
2. The price of recommended spares will not be used for the evaluation of bids. The price of these spares shall remain valid for a period of six (6) months from the date of Award of the Contract. Where the recommended spares are the same as mandatory spares, the price shall be the same. The price for the rest recommended spares must be given separately item-wise. The prices of any recommended spares which are not common with mandatory spares shall be subject to review by the Owner, and shall be finalized after mutual discussion. While the award for mandatory spares will be finalized at the time of the award of mechanical equipment, award for recommended spares will be finalized within six (6) months thereafter.

09.04.00 **Start-up Commissioning, Operation and Maintenance Spares**

1. Start-up commissioning spares are those spares which may be required during the start-up and commissioning of the equipment/system and initial operation and maintenance of the equipment/system by the bidder specified in this specification. All spares used until the plant is handed over to the Owner shall come under this category. Said spares, properly marked, shall be supplied together with the main equipment and shall be used by the Contractor, if needed, during erection and commissioning stages. All such spares which remain unused after the issue of the Taking-Over Certificate by owner along with an equipment-wise quantitative consumption report shall be returned to the owner during time of handover by the Contractor. The list of commissioning spares to be brought by the Contractor to ensure smooth commissioning of the plant shall be subjected to the Engineer's approval.

09.05.00 The Contractor shall submit a complete list of all such start-up spares costs of the above spares which are consumed before the handing-over of the plant shall be deemed to have been included in the lump sum proposal price of the Package, and the Contractor shall have no claim on this account to the Owner.

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10.00.00 EXCLUSIONS:

10.01.00 Following equipment/items and systems are excluded from bidder's scope.

SL NO	DESCRIPTION
1	Wagon Tippler with rails
2	Side arm charger
3	Apron Feeder with dribble conveyor
4	Vibration monitoring System for crushers
5	Reversible Stacker cum reclaimer
6	Rails for stacker cum reclaimer 52 kg/m
7	Cooling water system
8	In Motion Weigh Bridge
9	Bull dozer (400) BHP with standard accessories.
10	Pay loader (300) FHP with standard accessories.
11	Bunker level indicators
12	Locomotives
13	EOT Crane for Wagon Tippler complex
14	HT Motors for Crushers

10.02.00 Civil & Structural works as specified elsewhere in the specification.

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11.00.00 PERFORMANCE GUARANTEE

11.01.00 The successful bidder shall be responsible for proper design, smooth and trouble-free operation of all the systems, equipment and components offered by him.

11.02.00 The successful bidder shall guarantee that the material of construction and workmanship of all the equipment and components supplied by him are as specified under this specification and wherever there is nothing specifically mentioned shall correspond to the best available grade and quality.

11.03.00 The successful bidder shall also guarantee that the system, equipment and components covered by this specification shall be as per relevant standard and code and shall be suitable for continuous operation (i.e. 24 hours per day).

11.04.00 However, the sequence of P.G. Test shall be (1) Testing & Commissioning, (2) Trial Operation, (3) P. G. Test. After completion of the above procedure, finally take over by Plant Owner.

Bidder shall guarantee the performance requirement of all coal handling paths for the guaranteed capacity of 1500/2000 MTPH per stream considering loaded start of conveyors and equipment, as applicable. Equipment like wagon tippler, apron feeder, belt conveyors, belt feeders, crushers, magnetic separators, belt weighers, Roller Screen, travelling trippers all are included in this test. Each stream shall be tested separately for continuous running of 8 hours.

11.05.00 The Plant Performance Guarantee Test (and any repeats thereof) shall be conducted by the Contractor after Completion of all Facilities and handing over to ascertain whether the Facilities or the relevant part(s) can attain the Functional Guarantees specified in the Contract Documents (as mentioned in the Lead specification; Volume-IIA). The contractor shall intimate the owner of his intent to carry out the Functional Guarantee test along with the schedule in advance (at least 4 weeks) to the owner

The Contractor's and Engineer-In-Charge's advisory personnel shall attend the Guarantee Test. WBPDC shall promptly provide the Contractor with such information as the Contractor may reasonably require in relation to the conduct and results of the Guarantee Test (and any repeats thereof).

11.06.00 If the Facilities cannot be used by reason of such defect and/or making good of such defect, the Defect Liability Period of the Facilities or such part, as the case may be, shall be extended by a period equal to the period during which the Facilities or such part cannot be used by WBPDC because of any of the aforesaid reasons.

At the end of the Defect Liability Period, the contractor liability ceases except for Latent Defects and the Owner will issue Final Acceptance certificate for the Plant/or the portion of the Plant taken-over as the case may be.

For all corrected defects in the Facilities by repair/replacement, such repair/replacement shall have the extended defect liability period of twelve (12) months from such replacement, however the Defect Liability cumulatively on all such facilities requiring attention due to defect and repair /replacement work has been carried out shall cease on expiry of twelve (12) months from issuance of Final Acceptance certificate.

The contractor's liability for latent defects warranty for the plant and equipment including spares shall be limited to a period of five (05) years from the end of Defect Liability Period of

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the respective plant and equipment including spares.

11.07.00 Major equipment shall also be tested separately as detailed below:

11.08.00 **Description Guarantee Parameter**

- a) Bidder shall demonstrate all guaranteed parameter as described in WBDCL specification.
- b) Total Auxiliary Power consumption shall be demonstrated as per contract.
- c) Noise and vibration level of major equipments shall be demonstrated by bidder.
- d) Ring Granulator Guaranteed capacity 1500MTPH
- e) Roller Screen Guaranteed capacity 1500MTPH

11.09.00 Bidder shall guarantee the total power consumption path-wise at guaranteed capacity required at the input terminals of drive motors of the following equipment at the above mentioned guaranteed capacity performance requirements.

All Conveyors, Belt Feeders, Wagon Tippler, Apron Feeder, Roller Screens, Crushers, Magnetic Separators as applicable connected to one stream.

11.10.00 The contractor shall submit P.G. Test procedures to the Owner, for approval, prior to conduct of P.G. Test.

11.11.00 Equipment common to different path shall be tested for performance once as per above requirement during testing of particular path and test results of such tests shall be used for other paths, as applicable, for common portions.

11.12.00 Bidder shall submit declaration along with bid documents in specified proforma to furnish all his guaranteed parameters, short fall in which shall attract levy of liquidated damages as applicable.

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12.00.00 LIQUIDATED DAMAGES FOR SHORT FALL IN PERFORMANCE

- 12.01.00 Should the results of the Performance Guarantee tests as stipulated in specification show that equipment have failed to meet the guaranteed capacity performance requirements, the contractor shall carry out the modification if necessary within 90 days of such tests. If the equipment fails to meet the guaranteed parameters at the end of the above specified period of 90 days owner may at his discretion reject the equipment or accept after assessing the liquidated damages listed herein under to be payable by contractor:
- 12.02.00 For each item as specified in WBPDC Technical Specification.
- 12.03.00 For common equipment covered under different path or for testing of individual equipment, liquidated damages shall be applicable once only for each piece of equipment.

13.00.00 LIQUIDATED DAMAGES FOR POWER CONSUMPTION

- 13.01.00 If the total power consumption at the input terminals of various drive motors exceed the Guaranteed figure of power consumption, the Liquidated damages shall be payable by the contractor at a rate specified in this specification over the Guaranteed figure.
- 13.02.00 For the purpose of above, the power consumption (total) of all conveyors drives (one stream) and other equipment as specified shall be at the guaranteed capacity of 1500 MTPH /2000MTPH and shall be same as obtained during the P&G test of different flow paths, specified below.

Flow Path 1	From Wagon Tippler to Boiler Bunker of Unit-V @1500MTPH
Flow Path 2	From TP-19 to Boiler Bunker of Unit-V @2000MTPH

Contractor shall bring and calibrate any instruments that are required for measuring the power consumption of the machine during performance and guarantee tests.

- 13.03.00 The liquidated damages for short fall in performance and for power consumption as per the aforesaid provision shall be applicable independent of each other and shall be without any limit with regard to their total amount. Such liquidated damages may be recovered by BHEL by deduction from the contract price, by enforcing the contract performance guarantee or in any other manner.

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14.00.00 QUALITY ASSURANCE.

14.01.00 Quality Assurance Documents

1. Bidder shall be required to submit in two (2) copies the following quality assurance documents within two weeks after dispatch of the equipment:
2. All non-destructive examination procedures, stress relief and weld repair procedure actually used during fabrication.
3. Welding procedures, welders, welding operator's qualification certificates.
4. Welder identification list, listing welders and welding operator's qualification procedures and welding identification symbols.
5. Material mill test reports on components.
6. The inspection plan with verification, inspection plan check points, verification sketches, if used and method used to verify that the inspection and testing points, in the inspection plan were performed satisfactorily.
7. Sketches & drawings used for indicating the method of tractability of the radio graphics to the location on the equipment.
8. Non-Destructive Examinations result reports including Radiography Interpretation Reports.
9. Stress Relief Time Temperature Charts.
10. Factory Tests results for testing required as per applicable Codes and Standards.
11. Inspection Records duly signed by Quality Assurance Personnel of the Employer and Contractor for agreed Inspection Hold Points. The same shall be recorded during course of inspection. Also the copy of repair/upgrading process & procedures, requiring employers approval shall be provided in documentation package.
12. Record of disposition of deviations duly authorized by the Employer.
13. Notification of Conformity certifying that the equipment is in compliance with finalized specification requirement.

14.02.00 General Requirements - Quality Assurance:

1. The detailed quality plans for manufacturing and field activities to be drawn up by bidder, separately as per BHEL format and should be submitted for customer approval.
2. Manufacturing Quality Plan will detail out all the components of equipment, various tests/inspection, to be carried out as per the requirement of the specification and standards mentioned and quality practices & procedures followed by bidder quality control organization, the Relevant Reference Documents and Standards, Acceptance Norms, Inspection Documents raised etc. during a!) Stages of Materials Procurement, manufacture, assembly and final testing/performance testing.
3. Field Quality Plan will detail out for all the equipment, the quality practices and procedures etc. to be followed by the contractor during various stages of site activities from receipt of materials equipment at site.
4. Bidder shall also furnish copies of reference documents/plant standards/acceptance norms

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test and inspection, procedure, etc. as referred in quality plans. These quality plans and reference documents/standards etc., will be subject to customer approval without which manufacture shall not proceed.

5. No material shall be dispatched from the manufacturers work before the same is accepted subsequent to pre dispatch final inspection including verification of records of all previous tests/inspection by the Employer's Engineer/Authorized Representative and duly authorized for dispatch, issuance of MDCC.
6. All materials used for equipment manufacture including castings and forgings etc. shall be tested quality as per Relevant Codes/Standards. Details of Results of the tests conducted to determine the Mechanical Properties, Chemical Analysis and Details of Heat Treatment Procedure shall be recorded on Certificates and Time Temperature Charts. Tests shall be carried out as per applicable Material Standards and/or Agreed Details.
7. All Welding/Brazing shall be carried out as per procedure drawn and qualified in accordance with, requirements of ASME Section IX/BS-4870 or other International Equivalent Standard acceptable to the Customer.
8. All Brazers/Welders and Welding Operators employed on any part of the contract either in contractors/his subcontractors works or at site or elsewhere shall be qualified as per ASME section IX or BS 4871 or other equivalent international standards acceptable to the customer.
9. Test results of Qualification Tests and Specimen Testing shall be furnished for approval.
10. All the Heat Treatment Results shall be recorded on Time Temperature Charts and verified with Recommended Regimes.
11. No welding shall be carried out on Cast Iron components for repair.
12. Unless otherwise proven and specifically agreed, welding of dissimilar materials and high alloy materials shall be carried out at shop only.
13. All non-destructive examination shall be performed in accordance with Written Procedures as per International Standard. NDT shall be recorded in a report which includes details of methods and equipment used, result evaluation, job data and identification of personnel employed and details of correlation of the test report with the Job.
14. Quality Plan submitted by bidder shall detail out, various stages of Manufacture and Installation, the Quality Practices and Procedures, the relevant reference Documents/Standards used, Acceptance Level, Inspection of Documentation raised etc.
15. Quality Audit/Surveillance/Approval of the results of tests and inspection will not however, prejudice the right of the customer to reject the equipment if it does not comply with the specification when erected or does not give complete satisfaction in service and the above shall in no way limit the liabilities and responsibilities of the contractor in ensuring complete conformance of the materials/equipment supplied to relevant specification, standard, data sheets, drawings, etc.
16. For all spares and replacement items, the quality requirement as agreed for the main equipment supply shall be applicable.
17. Repair/Rectification Procedures to be adopted to make the Job Acceptable shall be subject to the Customer Approval.

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14.03.00 Inspection & Testing

1. Bidder shall give 15 days' advance written notice of equipment being ready for testing. The customer / Inspector, unless the witnessing of the tests is virtually waived, will attend such tests within 15 days of the date on which the equipment is notified as being ready.
2. Type & Routine Test Report/Certificates shall include details of the Standard to which the tests are performed, Test Parameters, Acceptance Criteria, Test Set up etc. used during the Testing along with the Test Piece Details/Rating and the Detailed Test Record and the Final Test Result.
3. All Inspection, Measuring and Test Equipment used by the contractor shall be calibrated periodically. Bidder shall maintain all relevant records of Periodic Calibration, Instrument Identification, and shall provide for inspection by the Bidder wherever asked specifically, bidder shall calibrate Measuring/Testing Equipment in the presence of the Employer.
4. The details of the checks to be carried out for Various Components (MQP) are to be submitted within one month from the date of Purchase Order by the bidder for Customer Approval. However, some Indicative Checks on Different Items are given below which should necessarily form part of the Quality Assurance Plan to be agreed with the Customer.
5. All plates above 20 mm Thickness to be Ultrasonically Tested for Laminations.
6. Shaft Forgings Suspension Bars to be checked for Hardness, Microstructure and Ultrasonic Testing in addition to check for the Chemical and Mechanical Properties.
7. Following minimum NDT requirement to be ensured for Welds:
 - (a) Butt Welds - 10% UT/RT and 100% MPI.
 - (b) Fillet welds - 10% MPI.

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15.00.00 DRAWINGS AND DOCUMENTS SUBMISSION

15.01.00 Bidder shall furnish the contain Full Details and Drawings of the Equipment, Furnished Data Sheet, Technical Particulars, Testing Procedures and O & M manuals of the Equipment. **Successful bidder has to submit drawing/documents as per tentative list of drawing with schedule of submission is provided in Annexure-9.** Other drgs. /documents to be submitted by the successful bidder shall be finalized with WBPDC (or their consultant) / BHEL after award of the contract and the bidder shall furnish the drgs. / docs accordingly. Engineering drg/doc must essentially contain the following (individual to system, equipment and items of but not limited to these and any drg/ doc required desired by BHEL/WBPDC shall be furnished by the vendor during detail engineering:

- (a) General arrangements drgs. of all the junction towers, all the conveyors, crusher houses included in the scope as specified, the individual equipments, associated accessories.
- (b) Civil assignment drgs with Load data for all above
- (c) Various schedules
- (d) Design calculations
- (e) Data sheets, Type test reports
- (f) Fabrication drgs of chutes & technological structures of machines
- (g) O&M manuals and E&C manuals
- (h) PG test procedures, QAP, FQP
- (i) Other drawing/documents specified in WBPDC NIT specification
- (j) Cable Tray Layout, Earthing and Lightning Protection Layout

15.02.00 All documents shall be submitted through BHEL's Document management system "WRENCH" for which BHEL shall provide single login id and password to the successful bidder. Successful bidder shall receive all commented/ approved documents through "WRENCH" only.

15.03.00 The supplier shall there upon furnish eight (08) prints along with reproducible original of the approved drawings / Data documents. The drawing shall be given in suitable form and software which can be integrated with the customer computer aided design system.

15.04.00 ERECTION DRAWINGS

1. The Supplier shall furnish Erection Drawings for the Equipment to be erected. These shall generally comprise of Fabrication / Assembly Drawings, Various Component/Part Detail Drawings, Assembly, Clearance, Data Requirements etc. The Drawings shall contain details of Components/Equipment with Identification Numbers, Match Marks, Bill of Materials, Assembly Procedures etc. For all major Equipment apart from above details, Assembly Sequence and Instructions with Check Lists shall be furnished in the form of Erection Manuals.
2. Supplier shall submit all GA drawings of equipment, Design Calculations for Selection of equipment, Size of Dozer Shed, Data Sheets. Any Other Drawing requested by the Customer shall also be submitted.

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3. Vendor should start submitting all the GA Drawings within two weeks of the Receipt of LOI and complete all GA drawing submission within two Months.
 4. Every Resubmission on any Drawing should be submitted within 07 Days from the Date of Comments.
 5. All Quality Plans shall be submitted within One Month after LOI.
- 15.05.00 Schedule & number of copies required for submission should be as per the details given below:

Sl. No	Description	Type of copies required	Number of copies required	Schedule of submission
1	Drawings / Documents for Approval	Soft Copies	-	Starting Two Weeks from LOI
2	Revised Drawings / Documents Incorporating Customer Comments if any.	Soft Copies	-	One Week after receipt of comments from WBDCL/DCPL forwarded by BHEL
3	Final Approved Drawings / Data / Documents	Prints & Soft Copies	6 Copies	One Week after Receipt of Approved Drawing from BHEL / Consultant.
4	Erection Drawings & Manuals	Prints	6 Copies	Eight (8) Weeks before the Despatch of the Equipment.
5	Pre-Commissioning / Commissioning Check List / Procedures.	Prints	6 copies	----- do -----
6	Quality Assurance Plan	Prints & Soft Copies	6 Copies	One Month from The Date of placing L.O.I
7	Final Operation & Maintenance Instruction Manuals	Prints & Soft Copies	One (1) Original & 6 Copies	One Month before the Despatch of the Equipment.

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16.00.00 LIST OF DOCUMENTS TO BE SUBMITTED ALONG WITH BID

Bidder shall submit signed and stamped copy of the following drawings / documents along with their bid

- 1) Deviation schedule with reference to specific clauses of the specification along with reason for such deviation.
- Or
- No deviation certificate.
- 2) Copy of pre-bid clarifications (if any).
- 3) Compliance cum Confirmation Certificate
- 4) Un priced copy of price format indicating quoted/ not quoted against each row/column along with cost of withdrawal / price implication format for deviations.
- 5) TECHNICAL PARTICULARS – MECHANICAL (format provided in Annexure#7)
- 6) Auxiliary Power Consumption Declaration (format provided in Annexure#7)
- 7) Signed & stamped copy of Electrical load list.
- 8) Electrical scope sheet between BHEL & VENDOR. (provided in Annexure#03)
- 9) Mechanical & civil scope sheet between BHEL & VENDOR. (provided in Annexure#11)

OFFER WILL BE CONSIDERED AS INCOMPLETE IN ABSENCE OF ANY OF ABOVE DOCUMENTS. DOCUMENT/S OTHER THAN ABOVE, IF ANY, SUBMITTED WITH THE OFFER WILL NOT FORM PART OF CONTRACT AND ACCORDINGLY WILL NOT BE CONSIDERED FOR BID EVALUATION.

OTHER DOCUMENTS TO BE SUBMITTED:

- 1) Detailed Project Schedule
- 2) Bidder to also submit tentative list of complete equipment schedule (Type, Rating). However, it shall be finalized during detailed engineering.
- 3) The bidder shall furnish the list of recommended spares for 3 years of normal operation of the plant and indicate the list and total FOR site price in relevant price format.
- 4) Catalogues/ Leaflets of respective equipments.
- 5) List of field devices including Type, Rating and Duty.

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17.00.00 COMPLIANCE CUM CONFIRMATION CERTIFICATE (to be submitted with bid)

COMPLIANCE CUM CONFIRMATION CERTIFICATE

The bidder shall confirm compliance with following by signing/ stamping this compliance certificate (every sheet) and furnish same with the offer.

1. The scope of supply, technical details, construction features, design parameters etc. shall be as per technical specification & there are no exclusions other than those mentioned under “exclusion” in section C and those resolved as per ‘Schedule of Deviations’, if applicable, with regard to same.
2. There are no other deviations w.r.t. specifications other than those furnished in the ‘Schedule of Deviations’. Any other deviation, stated or implied, taken elsewhere in the offer stands withdrawn unless specifically brought out in the ‘Schedule of Deviations’.
3. Bidder shall submit QP in the event of order based on the guidelines given in the specification & QP enclosed therein. QP will be subject to BHEL/ CUSTOMER approval & customer hold points for inspection/ testing shall be marked in the QP at the contract stage. Inspection/ testing shall be witnessed as per same apart from review of various test certificates/ Inspection records etc. This shall be within the contracted price with no extra implications to BHEL after award of the contract.
4. All drawings/ data-sheets/ calculations etc. submitted along with the offer shall be considered for reference only, same shall be subject to BHEL/ CUSTOMER approval in the event of order.
5. The offered materials shall be either equivalent or superior to those specified in the specification & shall meet the specified/ intended duty requirements. In case the material specified in the specifications is not compatible for intended duty requirements then same shall be resolved by the bidder with BHEL during the pre - bid discussions, otherwise BHEL/ Customer’s decision shall be binding on the bidder whenever the deficiency is pointed out.

For components where materials are not specified, same shall be suitable for intended duty, all materials shall be subject to approval in the event of order.

6. The commissioning spares shall be supplied on ‘As Required Basis’ & prices for same included in the base price itself.
7. All sub vendors shall be subject to BHEL/ CUSTOMER approval in the event of order.
8. Guarantee for plant /equipment shall be as per relevant clause of GCC /SCC /Other Commercial Terms & Conditions.
9. In the event of order, all the material required for completing the job at site shall be supplied by the bidder within the ordered price and within purview of the tender specification even if the same are additional to approved billing break up, approved drawing or approved Bill of quantities.

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10. Schedule of drawings submissions, comment incorporations & approval shall be as stipulated in the specifications. The successful bidder shall depute his design personnel to BHEL's/ Customer's/ Consultant's office for across the table resolution of issues and to get documents approved in the stipulated time.
11. As built drawings shall be submitted as and when required during the project execution
12. The bidder has not tampered with this compliance cum confirmation certificate and if at any stage any tampering in the signed copy of this document is noticed then same shall be treated as breach of contract and suitable actions shall be taken against the bidder.
13. All technical deviations (if any) have been indicated in technical deviation schedule. Any commercial deviation/ document shall not be considered during technical evaluation. However, if any issue in the commercial documents / deviation related to technical requirements needs to be highlighted and resolve in technical evaluation only.
14. No aspect of commercial issues needs to be highlighted / resolved in technical evaluation and their offer is strictly in compliance with technical specification. Any technical deviations (e.g. related to MDL, required documentation etc. for completion of the project) raised by them in commercial deviation either explicit or implicit shall be considered null and void even if agreed by BHEL during commercial evaluation stage.
15. Bidder agreed to confirm and compliance with technical specification and subsequent clarification on bids during pre- award discussion.

**18.00.00 PRE-BID CLARIFICATION SCHEDULE**

S. No.	Section/Clause /Page No.	Statement of the referred clause	Clarification Required

The bidder hereby certifies that above mentioned are the only clarifications required on the technical specification for the subject package.

SIGNATURE: _____

NAME: _____

DESIGNATION: _____

COMPANY: _____

DATE: _____

COMPANY SEAL

_____++++++_____



ANNEXURE#1
of
TECHNICAL ENQUIRY SPECIFICATION
for
Coal Handling Plant Conveyor System

for
SAGARDIGHI THERMAL POWER PROJECT
1 x 660 MW UNIT NO. 5, PHASE – III
WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED

Content:

WBPDC NIT Specification (Refer separate attachment)



**ANNEXURE#2
of
TECHNICAL ENQUIRY SPECIFICATION
for
Coal Handling Plant Conveyor System**

**for
SAGARDIGHI THERMAL POWER PROJECT
1 x 660 MW UNIT NO. 5, PHASE – III
WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED**

Content: (Refer separate attachment)

- WBDCL Amendments
- Clarifications
- MOM



**ANNEXURE#3
of
TECHNICAL ENQUIRY SPECIFICATION
for
Coal Handling Plant Conveyor System**

**for
SAGARDIGHI THERMAL POWER PROJECT
1 x 660 MW UNIT NO. 5, PHASE – III
WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED**

Content:

ELECTRICAL SCOPE OF WORK



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**Coal Handling Plant for 1X660 MW
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Technical Enquiry Specification for
Coal Handling Plant – Conveyor System**

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ANNEXURE-3

ELECTRICAL AND C&I SCOPE

POWER SUPPLY SYSTEM

1.1 H.T. Supply

a. Feeders

Voltage & Frequency	11000 V AC, 3ph, 3W, 50 Hz
Voltage variation	±6%
Frequency variation	+3% -5%
Combined Voltage & frequency variation	10% (absolute sum)
Fault level	40 KA symm for 3 sec.
Earthing	non-effectively earthed

1.2 H.T. Supply

b. Motors above 160KW

Voltage & Frequency	3300 V AC, 3ph, 3W, 50 Hz
Voltage variation	±10%
Frequency variation	+3% -5%
Combined Voltage & frequency variation	10% (absolute sum)
Fault level	40 KA symm for 3 sec.
Earthing	non-effectively earthed

1.3 L.T. Supply

a. Motors up to 160 KW

Voltage & Frequency	415V AC, 3 phase , 3W, 50 Hz
Voltage variation	±10%
Frequency variation	+5% -5%
Combined Voltage & frequency variation	10% (absolute sum)
Fault level	50 KA symm. for 1 sec.
Earthing	effectively earthed
Space heater	240V, 1 phase, 2W, 50 Hz
Earthing	effectively earthed

b. Control, Protection & Metering for LT Switchgear/MCC/Control Panel

Voltage & Frequency	110V/ 240V AC ±10%, 1 phase, 50 Hz +5% -5%
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- c. Lighting, space heaters and A.C. control & protective devices (other than mentioned in point b above)

Voltage & Frequency	240V AC, 1 phase, 2W, 50 Hz
Voltage variation	±10%
Frequency variation	+3% to -5%
Combined Voltage & frequency variation	10% (absolute sum)
Earthing	effectively earthed

- d. UPS power supply for PLC, control & instrumentation

Voltage & Frequency	240V AC, 1 phase, 2W, 50 Hz stabilized supply through UPS system
Type of Incoming/Outgoing feeder switching device	MCCB
UPS DB type	Single front/Double Fully draw out type
Short circuit level for 1 sec	25 kA (minimum)

- e. DC System data

Nominal Voltage to be selected for DC system	220V DC, 1 phase, 2W, 50 Hz
Voltage variation	-15% to +10%
Type of Incoming/Outgoing feeder switching device	Double pole Switch-Fuse
Short circuit level for 1 sec	25 KA (minimum)

- f. Other Voltage

Voltage	24V/ 48V
	Bidder to derive the required voltages are per requirement.

- g. Meteorological data of site is given below

Design ambient dry bulb temperature	50 °C maximum 5 °C minimum
Highest wet bulb temp	26.9 °C
Maximum relative humidity	84%
Average relative humidity	73%
Average annual Rainfall	1389 mm
Wind load :	In accordance with IS-875 for a basic wind speed of 47 m/sec, up to a height of 10 metres above mean ground level.
Seismic Zone	Zone III as per IS: 1893 latest edition
Altitude	34M above MSL

Note: For the purpose of design an ambient temperature of 50 deg. C



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ELECTRICAL SCOPE DIVISION –

Please refer Annexure-3.1 for complete scope matrix.

For Detailed specification of equipment refer WBDCL NIT documents.

The scope of this package is complete EPC of electrical and C&I for Conveyor system including design, engineering, manufacture/supply, inspection, delivery to site, loading/unloading at site, storage, shifting items to erection fronts, handling, erection, testing, commissioning and performance guarantee as per scope matrix.

Terminal point – From Discharge of Apron feeder & Dribble feeder up to Bunker.

For Free issue items: Bidder's scope starts from unloading, receipt, storage at site, shifting these items to erection fronts followed by erection & commissioning, trial operation, preparation of protocols and getting signed from end customer, final painting at site after erection, carrying out performance guarantee tests (under the supervision of respective OEMs) of integrated system and handing over to customer until satisfactory completion and written confirmation from customer.

Electrical BOQ for all BOI items shall be submitted within 3 months from LOI & electrical BOI ordering shall also be completed within 4 months from LOI.

Further all engineering drawings/datasheets shall be furnished within 5 months from LOI.

Inspection categorization plan, Vendor approval (if any) has to be submitted for all electrical C&I items within 4 weeks from LOI.

Datasheets as per NIT specifications to be strictly followed for all electrical items.

SN	ADDITIONAL NOTES
1.	The equipment shall be complete with all standard parts and accessories which are required for safe and trouble-free operation of the plant although not specifically mentioned in this specification. All safety feature, as required, shall be included.
2.	Supply, Testing, Transportation, Erection & Commissioning of all Electrics and Control & Instrumentation related to entire mechanical scope as per specification is in bidder's scope except supply of BHEL free issue items list at Annexure-3.2.
3.	Technical Specification furnished in this document are minimum. NIT specifications shall be fully binding in case of any conflict.
4.	Sub-Vendors for all bidders supplied instruments/ equipment shall be selected from BHEL preferred vendor list. However final vendors selected shall be subject to approval of BHEL/customer/consultant.
5.	Base frames, foundation bolts, couplings for all equipment for this package, including BHEL free issue items, shall be in the scope of Bidder. Civil inputs as required for related electrical equipment to be furnished by bidder.
6.	Details/dimensions of panels (supplied by bidder) located in BHEL's MCC switchgear room/control rooms, if any, shall be submitted by bidder during detailed engineering.
7.	Total drive list with calculation, load list and load curves shall be furnished by Bidder to be submitted within 30 days of LOI.

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SN	ADDITIONAL NOTES
8.	Load list/Feeder list with type and rating/power requirement shall be submitted by bidder to BHEL for providing feeders in BHEL's MCC. Wherever single phase supply is required, BHEL shall provide only 415V, 3 phase supply. Bidder shall generate single phase supply in the local control panel or power distribution board PDB with control transformers (supplied by bidder) as applicable.
9.	PJB/CJBs (supplied by bidder) shall be strategically located in each area to enable usage of multicore cables to PLC and optimize the cable lengths.
10.	All the field instruments shall be of latest models. For the sake of completeness of the system and in order to ensure desired performance and safety measures, any hardware or software item felt required, shall be in the scope of bidder irrespective of their explicit or implicit inclusion in this specification.
11.	All the instruments/equipment including transmitters, transducers, temperature elements, switches which are required to implement the control philosophy as specified in corresponding mechanical sections shall also be provided by the bidder.
12.	In addition to the remote control of various equipment, local push button stations & control panels shall be provided for all equipment supplied by bidder. Local starter panels as required shall also be considered by bidder.
13.	For successful implementation of control system, the bidder shall furnish Control philosophy/write-up, I/O list, drive list, termination details and all other details/drawings/data/ information which shall be used for preparation of logic diagrams (by bidder) for controls, interlock and protection of Bidder's equipment. Any other data as might be required by Employer during detailed engineering stage shall also be forwarded without any cost repercussions. Bidder shall depute his engineer to BHEL/Customer office for approval of above documents.
14.	Specification of various electrical equipment shall be as per the attached NIT Tender specification.
15.	Obtaining all necessary statutory clearances for bidder's equipment and systems shall be in bidder's scope.
16.	With regards to Makes of all electrical equipment, bidder shall obtain prior approval from BHEL-ISG before placing order. No makes shall be acceptable without prior approval by customer.
17.	Bidder should obtain prior customer approval for make, GA, schematics, data sheet, QAP for all items.
18.	Construction Power will be provided to bidder on chargeable basis. Power supply at one (1) point at 11 kV AC $\pm 10\%$, 3 Ph, 50 Hz. $\pm 5\%$ near the erection site shall be made available. For further distribution, supply of transformer & ACDB / MCC, energy meter shall be in the bidder scope. Any other voltage, if required for any operation during construction, shall be arranged by the Contractor from above source of Power supply.
19.	Bidder shall submit equipment layout, cable tray layout, lightning protection layout, earthing layout drawings as applicable. List of Drawings to be submitted for each equipment/system shall be intimated to the successful bidder during detailed engineering and drawings shall be submitted in line with the list.
20.	Bidder shall prepare cable schedule in BHEL format which will be furnished during detailed engineering stage.
21.	The Bidder shall furnish the reports of all the type tests carried out within five years of the date of bid opening as per specification and relevant standards for all components / equipment / systems. These reports should be for the tests conducted on identical/similar components / equipment / systems to those offered / proposed to be supplied under this contract. If the above reports are not found meeting the spec/relevant standards or not available, then all such test shall be conducted under this contract by the Bidder free of cost to purchaser and reports shall be submitted for approval.
22.	Minimum 2 NO + 2 NC Potential free Contacts shall be provided by the bidder from all equipment for interlocking purpose to PLC.
23.	Training of Customer and BHEL personnel for operation and maintenance of Bidder supplied

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SN	ADDITIONAL NOTES
	equipment is included in the bidder's scope.
24.	Testing, Erection and Commissioning of Bidder supplied equipment/systems is in Bidder's scope. Further, alignment of all motors including BHEL supplied free issue motors (during erection/commissioning) shall be included in the scope of Bidder.
25.	In case of any conflict & ambiguity, decision of BHEL/customer shall be final and binding.
26.	3D Modeling of Cable Tray routing of Transfer Points, Crusher House, Dust Suppression Pump House etc. shall also be in bidder's scope.
27.	Documentation shall be as per NIT specification. Successful Bidder to submit hard copies of all approved drawings/documents/QAP/Test reports as per NIT specification.
28.	Bidder to quote Recommended and mandatory Spares as per NIT specification.
29.	Elevator panel shall have redundant power supply.

ANNEXURE-3.1 ELECTRICAL AND C&I ITEMS SCOPE OF SUPPLY AND WORKS FOR CONVEYOR PACKAGE OF CHP- 1X660 MW SAGARDIGHI						
Sl.No.	Equipment	Design & Engineering	Supply	Receipt, Unloading/ Storage and Security	Local Transport, Erection, Testing and Commissioning	Remarks
1	11 KV and 3.3 KV HT switchboard	BHEL	BHEL	BHEL	BHEL	Bidder shall furnish HT load list with type, rating and power requirement.
2	HT Bus duct	BHEL	BHEL	BHEL	BHEL	
3	3.3 KV HT Motor except for Compressor	BHEL	BHEL	Bidder	Bidder	HT Motor input details (like, sizing calculations along with the interface details like GD ² values, T-S Curves, Speed, Coupling type, mounting arrangements Starting method etc.) shall be furnished by the bidder. Base frame, foundation bolt, LPBS, Control JB, Power JB etc. required for BHEL supplied HT motors shall be in Bidder's scope.
4	3.3 KV HT Motor for Compressor	Bidder	Bidder	Bidder	Bidder	Notch, provision for mounting key phasor and mounting pads for mounting of vibration Detectors on HT Motor/Coupling/Shaft etc. shall be provided by the bidder for Vibration Monitoring and Analysis System (VMAS supplied by BHEL). The exact provision required on bidder's equipment will be provided by BHEL during detailed engineering to successful bidder and bidder shall comply with the same. Bidder shall take care of the same in the bidder submitted drawings as well.
5	11/0.433 KV Dry Type Transformer	BHEL	BHEL	BHEL	BHEL	Bidder shall furnish LT load list with type, rating, duty and Power requirement.
6	LT Switchgear	BHEL	BHEL	BHEL	BHEL	
7	LT bus duct	BHEL	BHEL	BHEL	BHEL	
8	LT Motor	Bidder	Bidder	Bidder	Bidder	LT Motor sizing calculations along with the type of feeder requirement shall be furnished by the bidder. Motor shall be suitable for power cable terminations as per cable schedule. Power JB shall be provided by bidder, if required. Flexible Copper Cable between Power JB to Motor shall be in the scope of the bidder.

ANNEXURE-3.1 ELECTRICAL AND C&I ITEMS SCOPE OF SUPPLY AND WORKS FOR CONVEYOR PACKAGE OF CHP- 1X660 MW SAGARDIGHI						
Sl.No.	Equipment	Design & Engineering	Supply	Receipt, Unloading/ Storage and Security	Local Transport, Erection, Testing and Commissioning	Remarks
9	Variable Frequency Drive Panel	Bidder	Bidder	Bidder	Bidder	VFD Panels as required for this Package is in scope of Bidder
10	HT Power Cable	BHEL	BHEL	BHEL	BHEL	
11	LT Power Cable	Bidder	BHEL	BHEL	BHEL/ Bidder	Bidder shall provide Cable sizing calculations, voltage drop calculation, cable schedule and cable Termination charts (between bidder supplied equipment) for customer approval. BHEL will supply the cable based on agreed BOQ of Cables. BOQ of cables shall be furnished by bidder along with calculation and justification. The BOQ shall be optimised as far as possible. Cabling and Termination between bidder supplied equipment is in the scope of bidder. Cabling and Termination between MCC/PLC and bidder supplied equipment is in the scope of BHEL. Cabling means laying of cable alongwith cabling accessories through BHEL laid cable trays.
12	Control and Instrumentation Cables	Bidder	BHEL	BHEL	BHEL/ Bidder	
13	Flexible, Trailing, Festoon, Composite, Co-axial, Un-armoured or any other special cable required for this package including fixing arrangement such as festooning, Cable reeling drum and bus bar etc. and Termination arrangement including supply of Junction Box etc.	Bidder	Bidder	Bidder	Bidder	For example: Any Copper flexible cable required for cable termination from PJB to LT/HT Motor, cable between belt weigher panel to JB etc.
14	All Data cables such as Profibus ,Modbus, Ethernet cable, OFC etc. and Special cables (other than standard screened/instrumentation cables) i.e., cables from sensor to controllers, indicators etc. OR Encoder cables OR HART instrument cables etc., as required .	Bidder	Bidder	Bidder	Bidder	Cable for establishing communication with CHP PLC over soft link shall be in the scope of bidder for CSU, Belt Watch Panel, VMAS, UPS etc.

ANNEXURE-3.1 ELECTRICAL AND C&I ITEMS SCOPE OF SUPPLY AND WORKS FOR CONVEYOR PACKAGE OF CHP- 1X660 MW SAGARDIGHI						
Sl.No.	Equipment	Design & Engineering	Supply	Receipt, Unloading/ Storage and Security	Local Transport, Erection, Testing and Commissioning	Remarks
15	Cable trays & cable tray supports	Bidder	BHEL	BHEL	BHEL/ Bidder	Cable tray arrangement/ layout on moving machine like Travelling Tripper shall be provided by Bidder. Erection of Cable Trays, as required, between Control & Power JB, Local Control Panels, PDB etc. and Drives, Field Instruments etc. is in the scope of bidder. Erection of Cable Tray between Switchgear, MCC building and Control & Power JB, Local Control Panels etc. shall be in the scope of BHEL.
16	Conduit (flexible, rigid)	Bidder	Bidder	Bidder	Bidder	Erection of Conduit, as required, between Control & Power JB, Local Control Panels, PDB etc. and Drives, Field Instruments etc. is in the scope of bidder.
17	Cabling accessories(Termination kits, Cable Glands , Lugs, Tags, Ferrules etc.)	Bidder	Bidder	Bidder	Bidder	Cabling accessories (supply of Termination kits, Cable Glands , Lugs, Tags, ferrules etc.) for Cabling works included in bidder's scope.
18	Earthing and Lightning Protection materials	Bidder	BHEL	BHEL	Bidder	Earthing (Electrical & Electronic) and Lightning Protection arrangement including preparation of Earthing and Lightning Protection Layout of enitre CHP area Transfer Points, Crusher House building, pump house etc., except Wagon tippler complex, is in the scope of bidder. Bidder shall provide BOQ of Earthing and Lightning Protection materials. BOQ shall be including all fixing hardware like nut, bolt and Lug etc. Bidder's scope of work is between bidder's supplied equipment to the nearest available earth conductor/ flat/ riser in Transfer Point/ Building etc. Preparation of Earthing and Lightning Protection Layout and obtaining approval from the customer for this package is in the scope of Bidder.

ANNEXURE-3.1 ELECTRICAL AND C&I ITEMS SCOPE OF SUPPLY AND WORKS FOR CONVEYOR PACKAGE OF CHP- 1X660 MW SAGARDIGHI						
Sl.No.	Equipment	Design & Engineering	Supply	Receipt, Unloading/ Storage and Security	Local Transport, Erection, Testing and Commissioning	Remarks
19	Local Push Button Stations (including for BHEL free issue HT Motors)	Bidder	Bidder	Bidder	Bidder	LPBS Schedule area wise to be submitted by Bidder. Number of NO+NC Contacts shall be considered as per Drive/equipment Control circuit requirement.
20	Power and Control Junction Boxes (for bidder supplied equipment and BHEL free issue items as required during detail engineering)	Bidder	Bidder	Bidder	Bidder	Motor, Equipment, Panel (LCP, DB, VFD panel, Starter panel etc.) shall be suitable for Power cable termination as per cable schedule, PJB shall be provided by Bidder if required. Flexible copper cable between PJB and respective Motor, Equipment, Panel shall also be in the scope of the bidder.
21	UPS with Batteries, UPS DB (For PLC panels, VMS panel, CSU etc.)	BHEL	BHEL	BHEL	BHEL	
22	220V Battery & Battery charger	BHEL	BHEL	BHEL	BHEL	
23	ACDB / DCDB / PDB / WDB / Receptacles	BHEL	BHEL	BHEL	BHEL	Bidder shall furnish the Transfer Point/ Building wise load list with power requirement and total power required for designing DBs. Cabling & Termination (including Gland & lug, Cable tag etc.) between DB and Local Panel, Field Instrument etc. is in the scope of bidder.
24	ECP/Control Desk	BHEL	BHEL	BHEL	BHEL	
25	Vibration Monitoring and Analysis system for HT Motors & Crushers	BHEL	BHEL	BHEL	BHEL	Notch, provision for mounting key phasor and mounting pads for mounting of vibration Detectors on HT Motors/Crushers/Pumps/Compressors/Coupling/Shaft etc. shall be provided by the bidder for Vibration Monitoring and Analysis System (VMAS supplied by BHEL). The exact provision required on bidder's equipment will be provided by BHEL during detailed engineering to successful bidder and bidder shall comply with the same. Bidder shall take care of the same in the bidder submitted drawings as well.

ANNEXURE-3.1 ELECTRICAL AND C&I ITEMS SCOPE OF SUPPLY AND WORKS FOR CONVEYOR PACKAGE OF CHP- 1X660 MW SAGARDIGHI						
Sl.No.	Equipment	Design & Engineering	Supply	Receipt, Unloading/ Storage and Security	Local Transport, Erection, Testing and Commissioning	Remarks
26	ELECTRICAL CONTROL PANELS, as required for: 1. Travelling trippers 2. Metal detectors (MD) 3. Inline Magnetic Separator (ILMS) 4. Suspended Magnet (SM) 5. Belt Monitoring System 6. Scoop coupling 7. Belt weigher 8. Hydraulic Door Control panel 9. Dust extraction systems 10. Air conditioning 11. Coal and Lime sampling system 12. Sum pump control panels 13. Diverter gates, Flap gates, RPG and Coal Scooper etc. 14. Ventilation system and Exhaust/supply air fans 15. Hoist/Crane control Panel and Isolator Panels 16. ACDB for field devices viz. ZSS, CBS etc. 17. Any other LCP for Conveyor system (CHP)	Bidder	Bidder	Bidder	Bidder	1. Complete scope of Local Control Panels required for this package is in scope of bidder. 2. The drawings of these Panels shall be approved by customer/consultant in line with the contract specifications. 3. BHEL will only provide 3 Ph, 415V AC power supply for these control panels, further distribution (including providing control transformer for 230V AC, 110V AC/DC, 24V AC/DC etc. is in the scope of Bidder. The Load requirement for these panels shall be furnished by the bidder during DDE for allocating power supply feeders in the MCC.
27	Hooters / Sirens as required	Bidder	Bidder	Bidder	Bidder	Hooters Schedule area wise to be submitted by Bidder.

ANNEXURE-3.1 ELECTRICAL AND C&I ITEMS SCOPE OF SUPPLY AND WORKS FOR CONVEYOR PACKAGE OF CHP- 1X660 MW SAGARDIGHI						
Sl.No.	Equipment	Design & Engineering	Supply	Receipt, Unloading/ Storage and Security	Local Transport, Erection, Testing and Commissioning	Remarks
28	Pull chord Switch, Belt-Sway Switch, Zero-Speed Switch, Heavy Duty Limit Switch, Torque Limit Switch, Over-Speed Switch, Instruments, Gauges, Transmitters, Sensors, Solenoid Valves, Control Valves, Actuators, Proximity Limit Switches etc. and any other item required but not limited to above shall be considered for Safe & reliable Operation and Monitoring of the system .	Bidder	Bidder	Bidder	Bidder	Safety switch schedule, Instrument schedule to be submitted by the Bidder. Bracket, Structural Steel for mounting field equipment, Instrument is in the scope of bidder. Zero Speed Switch shall be supplied with Belt Speed Indication.
29	PLC system (Honeywell make)	Bidder	WT Pkg Vendor	WT Pkg Vendor	WT Pkg Vendor/ Bidder	Supply of Honeywell make PLC is by Wagon Tippler Package (WT Pkg) supplier. Control Philosophy, Control logic diagrams, Drive list, IO List (including interfacing signal list with other packages/ Machines),P&I drawing, Instruments list/schedule, etc. including KKS tags for this package is in the scope of bidder. Bidder to depute official at manufacturer's place, Customer place and site for document preparation and approval , software testing and inspection place and supervision for site commissioning. Coordination with WT Package vendor for software preparation and integration with existing PLC is in bidder's scope.
30	Illumination system	BHEL	BHEL	BHEL	BHEL	

ANNEXURE-3.1 ELECTRICAL AND C&I ITEMS SCOPE OF SUPPLY AND WORKS FOR CONVEYOR PACKAGE OF CHP- 1X660 MW SAGARDIGHI						
Sl.No.	Equipment	Design & Engineering	Supply	Receipt, Unloading/ Storage and Security	Local Transport, Erection, Testing and Commissioning	Remarks
31	Hoists and Cranes	Bidder	Bidder	Bidder	Bidder	Complete scope of Electrical and C&I portion is in scope of Bidder. BHEL will provide only 415V AC,3Ph supply up to wall mounted Isolator (supply and erecting of Isolator is in the scope of bidder) , further distribution including busbar/Trailing/Festoon Cables , isolators, supporting structure etc. is in bidder's scope. Hoist & Crane Schedule area <u>wise to be submitted by Bidder.</u>
32	Air Conditioning System for this package	Bidder	Bidder	Bidder	Bidder	Supply, Laying & Termination of Power and C&I cable to Air conditioning Control Panel / Power distribution board (Two incomers with auto changeover) shall be arranged by BHEL. Supply, erection and commissioning of complete Air conditioning system and its associated electrics and C&I is in the scope of Bidder.
33	Ventilation System for this package	Bidder	Bidder	Bidder	Bidder	Supply, Laying & Termination of Power and C& I cable to Ventilation Control Panel / Starter Control panel shall be arranged by BHEL. Supply, erection and commissioning of complete Ventilation system and its associated electrics and C&I by Bidder.
34	DE- System for this package	Bidder	Bidder	Bidder	Bidder	Supply, Laying & Termination of Power and C&I cable to DE system Control Panel / Starter Control panel shall be arranged by BHEL. Supply, erection and commissioning of complete DE system and its associated electrics and C&I by Bidder.
35	Structural steel for the E&C of Bidder supplied Equipment/items	Bidder	Bidder	Bidder	Bidder	
36	All Spares related to bidder supplied equipment	Bidder	Bidder	Bidder	Bidder	All the applicable spares as per the Customer NIT specs (Volume-II ,General & Schedules, Ch 9 : Mandatory Spares sheet 1 to 109) shall be supplied by Bidder after approval of Spares List from end user.
37	Maintenance Tools and Tackles as applicable	Bidder	Bidder	Bidder	Bidder	

ANNEXURE-3.1 ELECTRICAL AND C&I ITEMS SCOPE OF SUPPLY AND WORKS FOR CONVEYOR PACKAGE OF CHP- 1X660 MW SAGARDIGHI						
Sl.No.	Equipment	Design & Engineering	Supply	Receipt, Unloading/ Storage and Security	Local Transport, Erection, Testing and Commissioning	Remarks
Notes:						
1	Bidder shall supply all the Electrical and C&I items (including spares) as per attached Customer NIT/Contract Specification (including amendments, clarifications and MOM etc.)					
2	Receipt, Unloading, Storage, Transportation to site works, E&C of all Bidder supplied equipment/items is included in Bidder's scope. However, BHEL supplied (free issue) items are to be collected from BHEL's store. Further, transportation to site works, E&C also is included in Bidder's scope.					
3	Makes of all Electrical and C&I Items/equipment shall be from the Customer/Customer Consultant's approved vendors only. For any equipment, if makes are not specified, then vendor to obtain the prior approval from Customer/Customer Consultant for that sub-vendor.					
4	The Electrical and C&I items inspection category list shall be given to successful Bidder during detailed engineering.					
5	Construction Power of 415V, 3-phase, 4 wire (on chargeable basis) shall be provided at one point from the Distribution Transformer/Distribution Board. Further distribution (including Tariff Meter installation) from the Distribution Transformer/Distribution Board shall be carried out by Bidder as per requirement.					
6	Any Statutory Clearance required for E&C of equipment under bidder's scope shall be in the scope of bidder.					
7	Belt watch Panel shall be provided with Potential free contacts, Analog signals(4-20mA Live) and Soft communication Link with PLC. Switches shall be grouped MCC building-wise and Belt watch panel shall be considered for all MCC buildings.					
8	Control Philosophy, Control logic diagrams along with HMI Screens (MIMICs), Drive list, IO List (including interfacing signal list with PLC), P&I drawing, Instruments list/ schedule, Interconnection Cable termination Chart (ICS), Hook-up drawings, etc. including KKS tags for this package is in the scope of bidder. Bidder shall visit PLC manufacturer work place/ Site/ Customer place to provide support for Control logics and HMI screens and shall also attend the inspection along with the customer.					
9	All Compressor Local control panels (Microprocessor based, inbuilt skid type) shall have provision for communication with CHP PLC over soft link.					
10	Training of Customer and BHEL personnel for operation and maintenance of Bidder supplied equipment is included in the Bidder's scope.					
11	Final documentation as per Contract shall be in the Bidder's scope.					
12	Any other Electrical and C&I item (Hardware or Software) not covered above but required for completion of this package as per Customer NIT specs is in the scope of bidder.					
13	In case of any conflict & ambiguity, decision of BHEL/ Customer shall be final and binding.					
14	Bidder shall sign and seal the scope matrix.					
15	O and M manuals shall be provided by bidder for supplied equipment/items .					
16	3 D model drawings for this package is in the scope of bidder .					



ANNEXURE#4
of
TECHNICAL ENQUIRY SPECIFICATION
for
Coal Handling Plant Conveyor System

for

SAGARDIGHI THERMAL POWER PROJECT
1 x 660 MW UNIT NO. 5, PHASE – III
WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED

Content:(Refer separate attachment)

Drawings for Tender Purpose

- a. Coal Flow Diagram (total 01 sheets)
- b. Progressive Plot Plan (01 sheet)
- c. Tentative Conveyor Profile (01 sheet)



**ANNEXURE#5
of
TECHNICAL ENQUIRY SPECIFICATION
for
Coal Handling Plant Conveyor System
for**

**SAGARDIGHI THERMAL POWER PROJECT
1 x 660 MW UNIT NO. 5, PHASE – III
WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED**

Content: (Refer separate attachment)

- HSE (total 16 sheets)
- PPE Manuals (total 142 sheets)



**ANNEXURE#6
of
TECHNICAL ENQUIRY SPECIFICATION
for
Coal Handling Plant Conveyor System**

**for
SAGARDIGHI THERMAL POWER PROJECT
1 x 660 MW UNIT NO. 5, PHASE – III
WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED**

Content:

- WBDCL Vendor list



“The Vendor list as included is not exhaustive and prepared from prior experience of WBPDCL. In case of items not covered in the list or if the bidder seeks additional vendor on the items already covered in the list, the same should be done with proper written request for approval from WBPDCL enclosing the vendor credentials. Maximum effort should be exercised to include only such proven vendors who are already registered in the Bidder's Vendor directory and the bidder has prior experience of supply items from such reputed vendors.”

Sl. No.	Item Description	Vendor Name	
1	SEVERE SERVICE CONTROL VALVE. (PRDS & SH/RH ATTEMPERATION APPLICATION)	1	CONTROL COMPONENTS INC
		2	DRESSER VALVE INDIA PVT.LTD.
2.	BFP RECIRCULATION CONTROL VALVE	1	CONTROL COMPONENTS INC
		2	DRESSER VALVE INDIA PVT.LTD.
3.	NORMAL SERVICE CONTROL VALVE	1	MIL CONTROLS LTD.
		2	FISHER SANMAR LTD.
		3	DRESSER VALVE INDIA PVT.LTD.
		4	CONTROL COMPONENTS INC
4.	OIL TRIP VALVES (FUEL OIL SYSTEM)	1	MIL CONTROLS LTD.
		2	KHUME ARMATUREN GMBH
		3	DRESSER VALVE INDIA PVT. LTD.
5.	STEEL GATE / GLOBE / NR VALVES	1	WEIR B.D.K VALVES INDIA PVT. LTD.
		2	KIRLOSKAR BROTHERS LTD.
		3	LEADER VALVES LTD.
		4	KSB VALVES
		5	FOURESS ENGG.INDIA LTD.
		6	VAG VALVES
		7	AUDCO INDIA
		8	DEWARANCE
6.	BALL VALVES	1	FLOW CHEM INDUSTRIES
		2	FISHER SANMAR LIMITED
		3	KIRLOSKAR BROS. LTD.
		4	LEADER VALVES LTD.
		5	KSB VALVES
		6	WEIR B.D.K VALVES INDIA PVT. LTD.
		7	VAG VALVES
7.	CAST IRON GATE /GLOBE/ NR/ SAFETY RELIEF VALVES	1	H.SARKER & COMPANY
		2	G.M.DALUI & SONS PVT.LTD.
		3	KIRLOSKAR BROS. LTD.



Sl. No.	Item Description	Vendor Name	
		4	LEADER VALVES LTD.
		5	VENUS PUMP & ENGG. WORKS
8.	GUN METAL VALVES	1	LEADER VALVES LTD.
		2	SANT VALVES PVT. LTD.
		3	VALTECH INDUSTRIES ,MUMBAI
		4	SURYA VALVES AND INSTRUMENTS MANUFACTURING COMPANY,CHENNAI
		5	VAG VALVES
9	BUTTER FLY VALVES (STEAM SERVICE)	1	FOURESS ENGG.INDIA LTD.
		2	INSTRUMENTATION LTD.
		3	BDK PROCESS CONTL. HUBLI
10.	BUTTER FLY VALVES (WATER SERVICE)	1	WEIR B.D.K VALVES INDIA PVT. LTD.
		2	FOURESS ENGG.INDIA LTD.
		3	INSTRUMENTATION LTD.
		4	LARSEN & TOUBRO LTD.
		5	KIRLOSKAR BROS. LTD.
		6	VENUS PUMP & ENGG. WORKS
		7	TYCO VALVES & CONTROLS INDIA PVT.LTD.
11.	SPRING LOADED BYPASS VALVES	1	WEIR VALVES & CONTROLS M.E.
12.	PLUG VALVES	1	WEIR B.D.K VALVES INDIA PVT. LTD.
		2	FISHER SANMAR LIMITED
		3	LARSEN & TOUBRO LTD
		4	LEADER VALVES LTD.
13.	ANGLE DRAIN VALVES	1	REINEKE MEB-UND REGELTECHNIK GMBH
		2	SEMPELL AG, GERMANY
		3	VELAN INC.,CANADA
14.	AIR RELEASE VALVES	1	H.SARKER & COMPANY
		2	LEADER VALVES LTD.
		3	VENUS PUMP & ENGG. WORKS
		4	G.M.DALUI & SONS PVT.LTD.
15.	DUAL PLATE CHECK VALVES	1	VENUS PUMP & ENGG. WORKS
		2	FLUIDLINEVALVES COMPANY PRIVATE LTD.
		3	SURYA VALVES AND INSTRUMENTS MANUFACTURING COMPANY
		4	CHEMTECH INDUSTRIAL VALVES PVT.



Sl. No.	Item Description	Vendor Name	
			LTD.
		5	ASIAN INDUSTRIAL VALVES & INSTRUMENTS,
16.	FLOAT VALVES	1	H.SARKER & COMPANY
		2	G.M.DALUI & SONS PVT.LTD.
		3	LEADER VALVES LTD.
17.	FUEL OIL PUMPS (POSITIVE DISPLACEMENT PUMPS)	1	TUSHACO PUMPS PVT. LTD.,
		2	ALEKTON ENGG.INDUSTRIES PVT.LTD.
		3	U.T.PUMPS & SYSTEMS (P) LTD.
18.	JACKING OIL PUMPS WITH MOTOR (SCREW TYPE)	1	TUSHACO PUMPS LIMITED
		2	ALLWEILER AG ,GERMANY
19.	AUX. OIL PUMP (AOP) & EMERGENCY OIL PUMP WITH MOTOR (EOP)	1	KSB PUMPS LIMITED
		2	MATHER & PLATT PUMPS
		3	KBL
20	VACUUM PUMPS	1	EDWARDS LIMITED, UK
		2	NI-TECH INC. USA
		3	NASH ELOM INDUSTRIES, GERMANY
21	LUB OIL TRANSFER PUMPS	1	MATZ PUMPS PVT.LTD.
		2	TUSHACO PUMPS PVT.LT
22	CONCRETE VOLUTE PUMP	1	KIRLOSKAR BROS. LTD.
		2	CLYDE UNION PUMPS
		3	FLOWERVE CORPORATION
23.	PUMPS (VERTICAL)	1	KIRLOSKAR BROS. LTD.
		2	KSB PUMPS LTD.
		3	SULZER PUMPS INDIA LTD.
		4	WEIR,UK
		5	WPIL LIMITED
		6	FLOWMORE
24.	PUMPS (HORIZONTAL)	1	KIRLOSKAR BROS. LTD.
		2	MATHER & PLATT PUMPS LTD.
		3	KSB PUMPS LTD.
		4	SULZER PUMPS INDIA LTD.
		5	WEIR,UK
25.	SUMP PUMPS / SUBMERSIBLE PUMPS/ SLUDGE PUMP	1	KISHOR PUMPS PVT.LTD
		2	KIRLOSKAR BROS. LTD.
		3	KSB PUMPS LTD.
		4	SAM TURBO
26.	LUBE OIL PUMPS	1	KSB PUMPS LTD.



Sl. No.	Item Description	Vendor Name	
	(CENTRIFUGAL)FOR TDBFP	2	KIRLOSKAR EBARA, KIRLOSKARWADI
		3	SULZER, MUMBAI.
27.	LUBE OIL PUMPS (SCREW TYPE) FOR TDBFP	1	ALLWEILER, GERMANY
		2	IMO PUMP, USA
		3	TUSHACO, DAMAN
		4	LEISTRITZ (EMPIRE), GERMANY
28.	JACKING OIL PUMP TDBFP	1	TUSHACO, (DELTA CORP)
		2	HAGULLAND DENSION
29.	SCANNER AIR FAN	1	M/S.C.DOCTOR & CO.PVT.LTD.
		2	M/S PATELS AIRFLOW LTD.
		3	M/S.AIR CONTROL & CHEMICAL ENGG. CO.LTD.
30.	FLOW ELEMENTS	1	MICRO PRECISION PRODUCTS
		2	M/S ESPL KOLKATA
		3	IL PALGHAT
31.	OIL PURIFICATION UNIT (OIL CENTRIFUGE)/PORTABLE OIL PURIFIERS	1	PENNWALT LIMITED, INDIA
		2	ALFA LAVAL LIMITED, INDIA
		3	SERVIZE INDUSTRIAL, ITALY
32.	ELECTRICAL HOIST	1	AVON CRANES PVT.LTD.
		2	LIFTING EQUIPMENTS & ACCESSORIES
		3	REVA INDUSTRIES LTD
		4	CONSOLIDATED HOIST PVT LTD
		5	TUOBRO FURGUSON(INDIA)PVT.LTD
		6	HERCULES HOISTS LTD.
		7	DYNAMECH CRANES (P) LTD.
		8	UNIVERSAL HOIST – O- FABRIK
		9	ARMSEL MHE PVT.LTD
33	CHAIN PULLEY BLOCK	1	ARMSEL MHE PVT LTD
		2	LIFTING EQUIPMENT & ACCESPROES
		3	UNIVERSAL HOIS –O-FABRIK
		4	HERCULES HOISTS LTD.
		5	TUOBRO FURGUSON(INDIA)PVT.LTD
34	DOUBLE GIRDER EOT CRANE ABOVE 50T TO 150T (TG/GT HALL & OTHER AREAS)	1	HEAVY ENGG. CORPORATION LTD.
		2	MUKAND LIMITED,
		3	THE TATA IRON & STEEL CO.LTD
		4	UNIQUE INDUSTRIAL HANDLERS PVT.LTD
		5	WMI CRANES LTD.
		6	FURNACE & FOUNDRY EQUIPMENT



Sl. No.	Item Description	Vendor Name	
			CO.
35	DOUBLE GIRDER EOT CRANES UPTO 50T	1	WMI CRANES LTD.
		2	THE TATA IRON & STEEL CO.LTD
		3	UNIQUE INDUSTRIAL HANDLERS PVT.LTD
		4	MUKAND LIMITED,
		5	AVON CRANES PVT.LTD.
		6	REVA INDUSTRIES LTD.
		7	HEAVY ENGG. CORPORATION LTD.
		8	FURNACE & FOUNDRY EQUIPMENT CO.
36	SINGLE GIRDER EOT MISC.CRANES	1	REVA INDUSTRIES LTD.
		2	CONSOLIDATED HOIST PVT LTD
		3	LIFTING EQUIPMENTS & ACCESSORIES
		4	TUOBRO FURGUSON(INDIA)PVT.LTD
37	FURNACE MAINTENANCE PLATFORM	1	N.V.SKY CLIMBER EUROPE S.A
		2	N.V.SKY MAN INTERNATIONAL S.A.
		3	HING WING GONDOLA (HK) CO LTD, HONGKONG
38	ELEVATOR-PASSENGER CUM GOODS	1	KONE ELEVATOR INDIA LTD.
		2	OTIS ELEVATOR
		3	CITY LIFT (I) LTD.
		4	ECE Industries Ltd
39.	CASTABLE REFRACTORY	1	BASKAR REFRACTORIES AND S.W PIPES(P)LTD
		2	THE ACE REFRACTORIES LTD.
		3	DALMIA REFRACTORIES
		4	SOUVENIOR CERAMICS
40.	POURABLE INSULATION	1	BASKAR REFRACTORIES & STONEWARE PIPES(P)LTD
		2	THE ACE REFRACTORIES LTD.
		3	DALMIA REFRACTORIES
41.	FIRE BRICKS	1	BASKAR REFRACTORIES AND STONEWARE PIPES (P) LTD
		2	THE ACE REFRACTORIES LTD.
		3	DALMIA REFRACTORIES
		4	R V REFRACTORIES
42.	WOOL MATTRESS	1	ROCKWOOL INDUSTRIES LTD
		2	MINWOOL ROCK FIBRES LTD
		3	LAPINUS ROCKWOOL PVT. LTD



Sl. No.	Item Description	Vendor Name	
		4	ROCKWOOL INDIA LTD.
		5	LLOYD INSULATION (I) LTD.
		6	LLOYD ROCKFIBRES LTD.
43.	THERMAL INSULATION OF STEAM TURBINE/THERMAL INSULATION OF TURBINE INTEGRAL PIPING/THERMAL INSULATION- ROCKWOOL MATTRESSES/ PIPE SECTIONS	1	LLOYD INSULATIONS
		2	MINWOOL ROCK FIBERS
		3	ROCKWOOL
		4	LAPNNUS ROCKWOOL
44.	THERMAL INSULATION - ANCILLARY MATERIAL	1	LLOYD INSULATIONS (INDIA) LIMITED
		2	SURESH INDUSTRIAL CORPORATION
		3	ALLIED INSULATIONS (INDIA), GHAZIABAD
		4	ENERGY SAVING & ALLIED PRODUCTS
45	STEAM TRAPS	1	PREMIUM ENERGY TRANSMISSION LTD (GREAVES)
		2	SPIRAX MARSHALL PVT.LTD.
		3	PENNANT ENGINEERING PVT.LTD.
		4	LEADER VALVES LTD.
		5	OTOKLIN PLANTS AND EQUIPMENTS
46	AIR TRAPS	1	PENNANT ENGINEERING PVT.LTD.
		2	SPIRAX MARSHALL PVT.LTD.
47	CW TREATMENT PLANT (Items to be procured from the approved Vendor List)	1	CLEAR WATER LTD.
		2	THERMAX LTD.
		3	DRIPLEX WATER ENGG. LTD.
		4	CHEMBOND ASHLAND WATER TECHNOLOGIES LTD.,MUMBAI
		5	VA TEC WABAG LTD
48	GRAVIMETRIC FEEDER	1	STOCK INDIA
		2	MERRICK
49.	PORTABLE FIRE EXTINGUISHERS	1	ALERT FIRE SERVICES
		2	KOOVERJI DEVSHI & CO.PVT.LTD
		3	SAFEX FIRE SERVICES LTD.
		4	VIJAY INDUSTRIES & PROJECTS LTD
		5	ZENITH FIRE SERVICES (INDIA) PVT LTD
		6	NEW ENGINEERING CORPORATION
		7	NITIN FIRE PROTECTION INDUSTRIES LTD



Sl. No.	Item Description	Vendor Name	
		8	KANADIA FYR FYTER PVT.LTD.,
		9	GUNNEBO INDIA LIMITED
50	COMPRESSED AIR SYSTEM	1	ATLAS COPCO (INDIA) LTD.
		2	KOBELCO-KIRLOSKAR PNEUMATIC CO.LTD.
		3	INGERSOLL RAND (INDIA) LTD.
			KBL (only for Reciprocating type)
		4	TOSIBA,JAPAN
51	MILL REJECT SYSTEM (PNEUMATIC) (Items to be procured from the approved Vendor List)	1	MACAWBER BEEKAY PVT.LTD.
		2	DC INDTL.PLANT SERVICES PVT.LTD
		3	UNITED CONVEYOR CORPORATION (INDIA) PVT.LTD.,KOLKATA
52	CHLORINATION PLANT (Items to be procured from the approved Vendor List)	1	IEC FABCHEM LIMITED
		2	PERFECT CHLORO SYSTEMS
		3	CAPITAL CONTROLS INDIA PVT. LTD.
		4	PENWATT INDIA LTD
		5	METITO POLLUTION CONTROL INDIA LTD
53	CHEM. DOSING PLANT	1	MILTON ROY INDIA (P) LTD.
		2	SWELORE ENGG.PVT.LTD
		3	V.K.PUMP INDUSTRIES PVT.LTD.
		4	TECHNO CONSULTANTS
		5	PSI ENGINEERING SYSTEMS (P) LTD.,CHENNAI
		6	ENPRO INDUSTRIES PVT.LTD.,PUNE
54	CONDENSATE POLISHING UNIT (Items to be procured from the approved Vendor List)	1	DRIPLEX WATER ENGG. LTD.
		2	THERMAX
		3	ION EXCHANGE (INDIA) LTD
		4	VA TEC WABAG LTD, INDIA.
		5	BGR ENERGY SYSTEMS
55	COLTCS / SCS/DEBRIS FILTER (Items to be procured from the approved Vendor List)	1	TECHNOS, FRANCE
		2	GEA BGR ENERGY SYSTEM INDIA LTD.
		3	MULTITEX FILTRATION ENGINEERS LTD.
		4	FILTRATION ENGINEERS LTD.
		5	EIMCO WATER TECHNOLOGIES ,LLC, USA
		6	TAPROGGE GmbH
		7	KLUMP & KOLLER GmbH



Sl. No.	Item Description	Vendor Name	
56	ALUMINIUM SHEETS/ COILS	1	BHARAT ALUMINIUM CO.LTD.
		2	INDIAN ALUMINIUM CO.LTD.
		3	HINDALCO INDUSTRIES LTD.
		4	NATIONAL ALUMINIUM COMPANY LTD.
57	HOC TYPE GAS DRIER	1	DELAIR INDIA PVT. LTD.
		2	ATLAS COPCO (INDIA) LTD.
58	REFRIGERATION TYPE GAS DRIER	1	DELAIR INDIA PVT. LTD.
		2	SUMMIT
		3	SAVRO
59	HP BYPASS SYSTEM.	1	SULZER-CCI AG, SWITZERLAND
60	LP BYPASS SYSTEM.	1	SULZER-CCI AG, SWITZERLAND
		2	BOMABA, GERMANY
		3	WELLAND & TUXHORN, GERMANY
61	MISC. TANKS (SHOP)	1	GENERAL MECHANICAL WORKS
		2	UNITECH MACHINES LTD.
		3	TECHNO ELECTRIC & ENGG. CO. LTD.
		4	THERMOPADS PVT LIMITED
		5	VIJAY TANKS & VESSELS LTD
62.	FLAME ARRESTOR (MISCELLANEOUS TANKS)	1	PROCESS INSTRUMENTS
		2	ASIAN INDUSTRIAL VALVES
		3	ACCOUSTICS INDIA PVT. LTD.
		4	MULTITEX FILTERS PVT. LTD.
63	M.E. BELLOWS	1	FLUIDINE ENGRS.INDIA PVT.LTD
		2	EXPANSION JOINT SYSTEMS INC. USA
		3	MUNRO & MILLER FITTINGS LTD., U.K
		4	SENIOR FLEXONICS, U.K.
		5	SUR INDUSTRIES PVT.LTD.,KOLKATA
		6	CORBIS
64	HEAT EXCHANGERS (PLATE TYPE)	1	ALFA LAVAL (INDIA) LTD.
		2	GEA ECOFLEX INDIA PVT LTD
		3	TRANSTER INDIA PRIVATE LIMITED
		4	L&T
65	JOURNAL BEARING BFP & BP/THRUST CUM JOURNAL BEARING FOR CEP/THRUST BEARING (BFP & BP)	1	COLHERENE, UK
		2	WAUKESHA BEARINGS (GLACIER), UK
		3	KINGSBURY, USA
		4	MITCHELL, UK
66.	HYDRAULIC COUPLING	1	VOITH TURBO PVT LTD



Sl. No.	Item Description	Vendor Name	
67.	DISCONNECTING COUPLING FOR TDBFP	1	ZURN INC, USA
68.	SUCTION STRAINERS (BFP, BP & CEP)	1	OTOKLIN
		2	MULTITEX
		3	GUJARATH OTOFILT
69.	MECHANICAL SEAL (BFP/BP & CEP)	1	BURGMANN, GERMANY.
		2	EAGLE POONAWALA LTD.PUNE
		3	FLOWERVE SANMAR, CHENNAI
70	CONNECTING COUPLING FOR MD BFP SET & CEP	1	FLEXIBOX LTD., UK
		2	TURBOFLEX, UK
		3	BIBBY TURBOFLEX (FORMERLY EUROFLEX), UK
		4	EUROFLEX TRANSMISSION LTD., HYDERABAD.
71	CONNECTING COUPLING (MEMBRANE TYPE/GEAR TYPE) FOR TDBFP	1	EUROFLEX TRANSMISSION, HYDERABAD.
		2	RENK AG,GERMANY
		3	JOHN CRANE, UK
		4	KOPFLEX, USA
		5	BIBBY TURBOFLEX (FORMERLY EUROFLEX), UK
		6	AMERIDRIVES (ZURN), USA
		7	LUFKIN, USA/FRANCE
		8	BHS, GERMANY
		9	FLENDER GRAFFENSTADEN, FRANCE
74	GEAR BOX FOR TDBFP	1	WALCHAND NAGAR, PUNE
		2	RENK AG,GERMANY
		3	LUFKIN, USA/FRANCE
		4	FLENDER GRAFFENSTADEN, FRANCE
		5	BHS, GERMANY
75.	BARE RUBBER BELLOWS	1	CORI ENGINEERS PVT. LTD CHENNAI.
		2	SRM ESOFLEX PVT. LTD. KOLKATTA
		3	CORBIS
76.	SPRING SUPPORTS / HANGERS	1	SARATHI ENGG. ENTERPRISES PVT. LTD.
		2	HYDERABAD PIPING & ENERGY PRODUCTS (P) LTD. NEW DELHI
		3	SHAPE BAHADARABAD
		4	DARSHANI-INDIA
		5	PAL ENGINEERING YAMUNANAGAR
77.	SELF LUBRICATING BEARING	1	TEN MAT LTD UK



Sl. No.	Item Description	Vendor Name	
	TUBES FOR BF VALVES	2	(FEROFORM T 814 TUBES)
		3	THORDON
		4	THORPLAS TUBES, CANADA
78	FLUIDIZING AIR HEATER	1	ESCORTS
		2	SPHEREHOT
		3	RAYCOLD
		4	INDURE PVT. LTD.
79	ALLOY C.I. FITTINGS & LINERS	1	MENON METALLIKS
		2	CRAWLEY & RAY
		3	SAM CASTINGS
		4	CRESENT
80	ASH SLURRY PUMP/ BA OVERFLOW PUMP	1	SAM TURBO
		2	INDURE PVT. LTD.
81	KNIFE GATE VALVES	1	VAAS
		2	SISTAG, SWITZERLAND
		3	TYCO, USA
		4	VELAN, UK/USA
		5	INDURE PVT. LTD.
		6	ORBINOX INDIA (P) LTD.
82	MS AND GI PIPES	1	SAIL
		2	JINDAL
		3	INDUS TUBES
		4	SURYA ROSHNI
		5	TATA
83	STAINLESS STEEL PIPES	1	RATNAMANI METAL & TUBES
84	BASALT LINED PIPES AND FITTINGS	1	INDURE PVT. LTD.
		2	DEMECH
		3	ENVIRO ABRASION
85	MS ERW PIPES (SLURRY DUTY)	1	SAIL
		2	JINDAL
		3	JCO GAS PIPES
		4	TATA
86	TWIN LOBE TYPE ROTARY FLUDIZING AIR BLOWER	1	SWAM PNEUMATICS
		2	KAY INTERNATIONAL
		3	EVEREST
87	VACUUM PUMP / MECHANICAL EXHAUSTER (LIQUID RING TYPE)	1	KAKATI KARSHAK
		2	VACUNAIR
		3	GARDNER DENVER,KOREA
88	CRUSHER	1	THYSSENKRUPP.



Sl. No.	Item Description	Vendor Name	
		2	MCNALLY BHARAT ENGG. CO. LTD.
		3	LARSEN & TOUBRO
		4	ELECON ENGINEERING CO. LTD
		5	TRF LIMITED
89	APRON FEEDER	1	THYSSENKRUPP
		2	LARSEN & TOUBRO
		3	ELECON ENGINEERING CO. LTD.
		4	TRF LIMITED
		5	FL SMITH
		6	METSO
		7	MCNALLY BHARAT ENGG. CO. LTD
90	BELT VULCANIZER	1	SHAW ALMEX
		2	NILOS
		3	S. V. DATTAR
91	CONVEYOR BELT	1	SEMPERTRANS NIRLON, MUMBAI
		2	JONSON RUBBER
		3	PHONIX YULE, KOLKATA
		4	HILTON-FORECH
		5	MRF
		6	YOKOHAMA
92	ROLLER SCREEN	1	MSEL
		2	THYSSENKRUPP.
		3	ELECON ENGINEERING CO. LTD
92	REDUCTION GEAR BOX (Coal Handling Plant Only)	1	PREMIUM ENERGY TRANSMISSION
		2	FLENDER LIMITED
		3	ELECON ENGINEERING CO. LTD.
93	FLUID COUPLING (Coal Handling Plant Only)	1	VOITH
		2	PREMIUM ENERGY TRANSMISSION
		3	FLUIDOMAT
94	FLEXIBLE GEAR COUPLING	1	ELECON ENGINEERING CO. LTD.
		2	FENNER
		3	WELLMAN
		4	CONCORD
		5	GMB MFG. (P) LTD., KOLKATA
		6	HI-CLIFF
		7	LOVEJOY
95	BELT CLEANERS (SPRUNG TYPE) / MODULAR TYPE SKIRT	1	HOSCH EQUIPMENT, KOLKATA
		2	TRF
		3	CORBID ENGINEERING, MUMBAI



Sl. No.	Item Description	Vendor Name	
	SEALING	4	MASYC PROJECT PVT LTD.
		5	HYQUIP LTD, HYDERABAD.
96	THRUSTER BRAKE	1	BENGAL TECHNOCRAT
		2	WITTON KRAMER
		3	STROM CRAFT
97	BELT WEIGHER	1	INDUSTRIES SYNDICATE
		2	PBL
		3	TRANSWEIGH
		4	IPA
		5	SHENEICK PROCESS
98	TRAVELLING TRIPPER	1	MSEL
		2	BENGAL TOOLS
		3	HMTC
99	IN-LINE MAGNETIC SEPARATOR / SUSPENDED MAGNET	1	ELECTRO-ZAVOD
		2	PBL
		3	ELECTROMAGNETIC INDUSTRIES
100	ELECTRONIC METAL DETECTOR	1	ELECTROMAG DEVICES LTD., MUMBAI
		2	M. R. EQUIPMENT
		3	POWER BUILD, VALLABH VIDYANAGAR
101	CONVEYOR PULLEYS	1	BENGAL TOOLS
		2	MCNALLY BHARAT ENGG. CO. LTD.
		3	ELECON
		4	ARUDRA
102	CONVEYOR IDLERS	1	ELECON ENGINEERING CO. LTD.
		2	ARUDRA
		3	TRF LIMITED
		4	MCNALLY BHARAT, ENGG. CO. LTD.
		5	TEGA
		6	BENGAL TOOLS.
103	CENTRIFUGAL FANS (DE System)	1	ABB
		2	FLAKT INDIA
		3	TOURBOVANT
		4	APC
		5	DUSTVEN
104	VIBRATION ISOLATION	1	GERB
105	IDLER BEARING	1	FAG
		2	SKF
		3	HKT



Sl. No.	Item Description	Vendor Name	
		4	TATA TIMKEN
		5	ZKL
		6	KOYO
		7	NBC
106	RAIL CLAMP	1	SILVERLINE INTERNATIONAL.
		2	TECONNEX
107	PULLEY BEARING (SPLIT TYPE)	1	FAG
		2	SKF
		3	HKT
		4	COOPER
108	SELF ALIGNMENT (CARRIER & RETURN) ROLLER	1	TEGA.
		2	TRF LIMITED
109	RAIL	1	SAIL
		2	TATA
110	DUST EXTRACTION SYSTEM	1	THERMEX
		2	F. HARLEY
		3	TPS,DELHI
		4	SPRAYING SYSTEM , BANGALORE
111	DUST SUPPRESSION SYSTEM	1	KAVERI ULTRA POLYMER LTD.
		2	F. HARLEY
		3	TPS,DELHI
112	COAL SAMPLING UNIT	1	SUNRISE
		2	EASTMAN CRUSHER
113	ADOPTOR SLEEVE	1	SKF.
		2	BENGAL TOOLS
114	ENERGY CHAIN	1	IGUS
115	HYDRAULIC DRIVE FOR BELT CONVEYORS	2	HAGGLUNDS
116	BUNKER SEALING BELT	1	SYNERGY KOLKATA
		2	DHANVANTHRI ENGINEERS PVT. LTD.
		3	ALEX CONVEYOR
		4	MESTO
117	STRAINER	1	STRAINWELL INDIA
		2	ACME FLUID SYSTEMS
		3	SRK STRAINERS & VALVES INDIA
118	ROCK BREAKER AND GRABBER	1	JEHEL
		2	NAKODA MACHINERY
		3	MCQUAID ENGINEERING
		4	JCB INDIA LTD.



Sl. No.	Item Description	Vendor Name	
119	RACK AND PINION GATE	1	BENGAL TOOL
		2	MSEL
		3	HMTC
		4	DA ENGG.
120	FLAP GATE	1	DA ENGG.
		2	MERIT CHENNI
		3	MMHE
		4	MSE
121	LINER PLATE	1	SAIL
		2	TATA STEEL
122	TECHNOLOGICAL STRUCTURE MATERIAL	1	SAIL
		2	TATA STEEL
		3	ZINDAL
123	HOPPER CHUTE, SKIRT BOARD WITH SUPPORTING STRUCTURE	1	MSEL
		2	HMTC
		3	MMHE
124	REVERSIBLE BELT CONVEYOR	1	DHANVANTHRI ENGINEERS PVT. LTD.
		2	ALEX CONVEYOR
		3	MESTO
		4	LA MINING
	ELECTRICAL SYSTEM VENDORS		
1	HT SWITCHGEAR (11KV, 3.3 KV)	1	
		2	AREVA LTD.
		3	BHEL.
		4	SIEMENS LTD
2	PMCC, PCC & MCC	1	AREVA LTD.
		2	LARSEN & TOUBRO LTD.
		3	SIEMENS LTD
		4	SCHNEIDER
		5	ABB
3	AIR CIRCUIT BREAKER	1	AREVA LTD.
		2	LARSEN & TOUBRO LTD.
		3	SIEMENS LTD (3WL model only)
		4	SCHNEIDER
		5	ABB
4	AC CONTACTOR / AUX. CONTACTOR	1	L&T
		2	SIEMENS LTD



Sl. No.	Item Description	Vendor Name	
		3	SCHNEIDER
		4	ABB
		5	GE Power
5	AMMETER (INDICATING)	1	AUTOMATIC ELECTRIC
		2	IMP
		3	RISHABH INDUSTRIAL (L&T)
6	BREAKER CONTROL SWITCH/ SELECTOR SWITCH	1	KAYCEE
		2	ALSTOM LTD.
		3	GE – POWER
		4	SALZER, L&T
7	CURRENT TRANSFORMER	1	KAPPA ELECTRICALS
		2	PRAGATI ELECTRICALS
		3	PRAYOG
		4	SILKAANS
		5	PRECISE ELECTRICS
		6	SOUTHERN ELECTRICS
		7	SIEMENS
		8	AUTOMATIC ELECTRIC
		9	INDCOIL
8	CONTROL TRANSFORMERS	1	KAPPA ELECTRICALS
		2	SILKAANS
		3	SOUTHERN ELECTRICS
		4	PRECISE ELECTRICALS
		5	AUTOMATIC ELECTRIC
		6	INDCOIL
9	VOLTAGE TRANSFORMERS (VT)	1	INDCOIL
		2	KAPPA ELECTRICALS
		3	PRAGATI ELECTRICALS
		4	PRAYOG
		5	PRECISE ELECTRICS
		6	SILKAANS
		7	SOUTHERN ELECTRICS
		8	AUTOMATIC ELECTRIC
		9	SIEMENS
10	ACDB, DCDB, AC/DC FUSE BD, MLDB, ELDB, PDB, WELDING DB, VENTILATION DB	1	SCHNEIDER
		2	L&T
		3	SIEMENS
		4	GE – POWER
		5	ABB



Sl. No.	Item Description	Vendor Name	
11	OIL FILLED TRANSFORMER (More than 10 MVA)	1	BHEL
		2	GE
		3	AREVA T & D INDIA LIMITED
		4	FUJI
		5	ABB
		6	ALSTOM
12	OLTC	1	BHEL
		2	CTR
		3	MASCHINENFABRIK REINHAUSEN(MR)
13	OIL FILLED TRANSFORMER (Less than 10MVA)	1	CROMPTON GREAVES LTD.
		2	GE
		3	AREVA T & D INDIA LIMITED NAINI
		4	FUJI
		5	ABB
		6	ALSTOM
		7	KIRLOSKAR ELECTRIC CO. LTD.
		8	VOLTAMP TRANSFORMER LTD.
		9	ANDREW YULE & COMPANY LTD.
		10	BHEL
		11	SUDHIR TRANSFORMER
14	ELECTRONIC MOTOR PROTECTION RELAY (EMPR) INCLUDING EOGR	1	AREVA
		2	SIEMENS
		3	L&T
		4	GE – POWER
		5	SCHNEIDER
15	ENERGY METER	1	SECURE METERS (SEMS)
		2	SCHNEIDER CONZERVE
		3	L&T
16	FUSES ALONG WITH FUSE BASE	1	L&T
		2	ALSTOM LTD.
		3	SIEMENS
		4	SCHNEIDER
		5	ABB
17	ISOLATING SWITCH	1	SALZER, L&T
		2	SIEMENS
		3	ALSTOM LTD.
		4	GE – POWER
		5	SCHNEIDER



Sl. No.	Item Description	Vendor Name	
		6	ABB
		7	KAYCEE
18	INTERPOSING RELAYS	1	JYOTI
		2	OEN
		3	ABB
		4	ELESTA
19	INDICATING LAMP (LED)	1	SIEMENS
		2	VAISHNO
		3	L&T
		4	ALSTOM LTD.
		5	BCH
		6	GE – POWER
		7	SCHNEIDER
		8	CONCORD
		9	TECKNIC CONTROLS
		10	ABB
		11	ESSEN DEINKI
20	NON SEGREGATED PHASE BUS DUCTS	1	M/S KGS Engineering Limited
		2	L&T
		3	SIEMENS
		4	ALSTOM LTD.
		5	BEST & CROMPTON
21	LPBS (NON-FLAME PROOF)	1	L&T
		2	SCHNEIDER
		3	SIEMENS
22	LPBS(FLAME PROOF)	1	BALLIGA
		2	EX-PROTECTA
23	LOCAL MOTOR STARTER	1	L&T
		2	TELEMACHANIQUE (SCHNEIDER)
		3	SIEMENS
		4	ABB
		5	GE – POWER
24	MCCB(AC)	1	L&T
		2	GE – POWER
		3	SIEMENS
		4	SCHNEIDER
		5	ABB.
25	MCCB(DC)	1	L&T
		2	GE – POWER



Sl. No.	Item Description	Vendor Name	
		3	SIEMENS
		4	SCHNEIDER
		5	ABB.
26	MULTIFUNCTION METER	1	SECURE METERS (SEMS)
		2	SCHNEIDER CONZERVE
27	MINIATURE CIRCUIT BREAKER (MCB)	1	SCHNEIDER
		2	L&T
		3	SIEMENS
		4	ABB
28	MOTOR PROTECTION CIRCUIT BREAKER (MPCB)	1	AREVA
		2	SIEMENS
		3	L&T
		4	SCHNEIDER
		5	ABB.
29	NGR	1	RESITECH
		2	S. R. NARKHEDE
		3	RSI SWITCHGEAR
30	NUMERICAL RELAY	1	ABB
		2	AREVA MICOM
		3	SIEMENS (SIPROTEC)
		4	GE – POWER
		5	SCHNEIDER MICOM
		6	ALSTOM MICOM
31	SYNCHROSCOPE	1	AUTOMATIC ELECTRIC
		2	GEC - ALSTHOM
32	SWITCH & SOCKET (INDUSTRIAL TYPE)	1	CROMPTON GREAVES
		2	BCH
		3	ANCHOR
		4	BEST & CROMPTON
		5	ABB
33	SPACE HEATER	1	C&S ELECTRIC
		2	SPACEAGE
34	TRANSDUCER	1	AUTOMATIC ELECTRIC LTD.
		2	ELSTER
		3	SOUTHERN TRANSDUCERS
		4	CAMILLE BAUER, GERMANY
35	THERMAL OVERLOAD RELAY	1	L&T
		2	SIEMENS
		3	SCHNEIDER



Sl. No.	Item Description	Vendor Name	
		4	GE – POWER
		5	ABB
36	TIMER	1	BCH
		2	ALSTOM
		3	L&T
		4	SCHNEIDER
		5	ABB
37	TERMINALS BLOCK (FIXED / DRAW OUT)	1	PHOENIX
		2	CONNECT WELL
		3	ELEMEX
		4	WAGO
		5	ESSEN DEINKI
38	VOLTMETER (INDICATING)	1	AUTOMATIC ELECTRIC
		2	IMP
		3	RISHABH INDUSTRIAL (L&T)
39	LT PVC CONTROL CABLES	1	CABLE CORPORATION OF INDIA
		2	CORDS CABLE INDUSTRIES LTD
		3	DELTON CABLES LTD.
		4	KEC
		5	CRYSTAL CABLE INDUSTRIES LTD.
		6	KEI INDUSTRIES LTD.
		7	NICCO CORPORATION LTD.
		8	POLYCAB WIRES PVT.LTD
		9	TORRENT CABLES LTD.
		10	UNIVERSAL CABLES D.
		11	RPG
40	LT XLPE POWER CABLES	1	CABLE CORPORATION OF INDIA
		2	HINDUSTHAN VIDYUT PRODUCTS
		3	KEC INTERNATIONAL
		4	TORRENT CABLES LTD.
		5	UNIVERSAL CABLES LTD.
		6	POLYCAB WIRES PVT.LTD
		7	KEI INDUSTRIES LTD.
		8	NICCO
		9	CRYSTAL CABLE INDUSTRIES LTD.
41	LT PVC POWER CABLES	1	CORDS CABLE INDUSTRIES LTD
		2	CRYSTAL CABLE INDUSTRIES LTD.
		3	HINDUSTHAN VIDYUT PRODUCTS
		4	KEI INDUSTRIES LTD.



Sl. No.	Item Description	Vendor Name	
		5	NICCO CORPORATION LTD.
		6	POLYCAB WIRES PVT.LTD
		7	TORRENT CABLES LTD.
		8	UNIVERSAL CABLES LTD.
		9	CABLE CORPORATION OF INDIA
42	HT XLPE POWER CABLES	1	CABLE CORPORATION OF INDIA
		2	KEI INDUSTRIES LTD.
		3	HINDUSTHAN VIDYUT PRODUCTS
		4	NICCO CORPORATION LTD.
		5	UNIVERSAL CABLES LTD.
43	SCREENED CONTROL CABLES	1	DELTON CABLES LTD.
		2	KEI INDUSTRIES LTD.
		3	NICCO CORPORATION LTD.
		4	POLYCAB WIRES PVT.LTD
		5	CORDS CABLE INDUSTRIES LTD
		6	THERMO CABLES
44	220V DC LEAD ACID BATTERIES (TUBULAR AND PLANTE)	1	EXIDE INDUSTRIES LTD
		2	HOPPECKE, GERMANY / MALAYSIA
45	NICKEL – CADMIUM BATTERY	1	HBL POWER SYSTEMS, HYDERABAD
46	220V DC BATTERY CHARGER (More than 100 AH)	1	CHLORIDE POWER SYSTEMS & SOLUTIONS LTD
		2	STATCON POWER LTD.
		3	HBL POWER SYSTEMS LTD
47	220V DC BATTERY CHARGER (Upto 100 AH)	1	CHHABI ELECTRICALS PVT. LTD.
		2	AMARA RAJA POWER SYSTEMS PVT. LTD
		3	CHLORIDE POWER SYSTEMS & SOLUTIONS LTD
		4	STATCON POWER LTD.
		5	HBL POWER SYSTEMS LTD
48	TRANSFORMER (DRY TYPE)	1	VOLTAMP
		2	BHARAT BIJLEE
		3	AREVA
		4	CGL
		5	SUDHIR TRANSFORMER
		6	BHEL
49a	HT MOTORS (above 500 kW)	1	ABB
		2	BHEL
		3	SIEMENS



Sl. No.	Item Description	Vendor Name	
49b	HT MOTORS (upto 500 kW)	1	ABB
		2	BHEL
		3	SIEMENS
		4	CROMPTON GREAVES
		5	MARATHON
50	LT MOTORS	1	ABB
		2	SIEMENS
		3	CROMPTON GREAVES
		4	KIRLOSKAR
		5	BHARAT BIJLEE
		6	MARATHON
51	LIGHTING SYSTEM	1	BAJAJ ELECTRICALS LTD.
		2	CROMPTON GREAVES LTD.
		3	PHILIPS INDIA LTD.
52	LIGHTING MAST, LIGHTING TOWER	1	CGL
		2	BAJAJ
		3	PHLLIPS
53	LIGHT FITTINGS	1	BAJAJ
		2	PHLLIPS
		3	CGL
54	CABLE TERMINATION & JOINTING KITS	1	RAYCHEM RPG LIMITED,MUMBAI
		2	3M ELECTRO & COMMUNICATION
55	CABLE TRAYS & ACCESSORIES	1	JAMNA METAL COMPANY
		2	UNITECH FABRICATORS & ENGINEERS
		3	PATNY SYSTEMS (P) LTD.
		4	RATAN PROJECTS & ENGINEERING CO. PVT.LTD.
		5	INDUSTRIAL PERFORATION (INDIA) PRIVATE LIMITED.
		6	RABI ENGINEERING WORKS ,
		7	PREMIER POWER PRODUCTS PVT.LTD.
		8	PARMAR METAL PVT. LTD.
56	CABLE TRAYS SUPPORT SYSTEM WELDED TYPE (HOT DIP GALVANIZED)	1	JAMNA METAL COMPANY
		2	INDUSTRIAL PERFORATION (INDIA) PRIVATE LIMITED.
		3	PATNY SYSTEMS (P) LTD.
		4	RATAN PROJECTS & ENGINEERING CO. PVT.LTD.
		5	RABI ENGINEERING WORKS



Sl. No.	Item Description	Vendor Name	
		6	UNITECH FABRICATORS & ENGINEERS PVT.LTD.
57	TREFOIL CLAMPS	1	MOULDED FIBRE GLASS PRODUCTS
		2	ELECTROMAC INDUSTRIES
		3	SUMIP COMPOSITES PVT.LTD.
		4	AJMERA INDUSTRIAL & ENGINEERING WORKS
58	ABOVE GROUND EARTHING MATERIALS, GS FLAT, MATERIAL FOR LIGHTNING PROTECTION	1	RATAN PROJECTS &ENGINEERING CO. PVT.LTD.
		2	RABI ENGINEERING WORKS
		3	UNITECH FABRICATORS & ENGINEERS PVT.LTD.
		4	INDUSTRIAL PERFORATION (INDIA) PRIVATE LIMITED.
		5	JAMNA METAL COMPANY
		6	PATNY SYSTEMS (P) LTD.
59	MS ROD FOR BELOW GROUND EARTHING	1	STEEL AUTHORITY OF INDIA LIMITED
		2	RASHTRIYA ISPAT NIGAM LIMITED
60	400 kV DISC INSULATOR/ LONG ROD INSULATOR (120KN)/ BUS POST INSULATOR (For Switchyard)	1	BHEL
		2	NGK BIRLA, JAYASHREE
		3	W.S
		4	INDIAN POTTERIES
		5	SARBHANA
61	INSULATOR HARDWARE	1	EMC
		2	ITPPL
		3	TYCO
		4	Tag Corporation, Chennai
		5	IAC
		6	ELECTROMECH & TRANSTECH
62	CLAMPS & CONNECTOR	1	KLEMMEN
		2	UTSAV
		3	TYCO
		4	IAC
		5	MEGHNA
		6	ELECTROMECH & TRANSTECH
63	400 kV SF6 BREAKERS	1	ABB
		2	CGL
		3	SIEMENS
		4	AREVA T&D
64	400 kV SWITCHYARD CT	1	ABB
		2	CGL



Sl. No.	Item Description	Vendor Name	
65	400 kV SWITCHYARD PT	3	ALSTOM
		4	SIEMENS
		1	ABB
		2	CGL
		3	SIEMENS
66	400 kV ISOLATOR	4	ALSTOM
		5	BHEL
67	400 kV EARTH SWITCH	1	SIEMENS
		2	ABB
68	400 KV STRUCTURE	1	GOOD LUCK STEEL TUBES LTD., BULANDSHAHR (UP)
		2	UTKARSH TUBES AND PIPES LIMITED, KOLKATA, WEST BENGAL
69	400 kV LIGHTNING ARRESTER	1	CGL
		2	ELPRO INTERNATIONAL LIMITED, PUNE
		3	ALSTOM
		4	OBLUM ELECTRICAL INDUSTRIES PVT.LTD., HYDERABAD
70	LIGHTING POLE	1	BOMBAY TUBE & POLES CO..
		2	BAJAJ ELECTRICALS LTD.
71	SEGREGATED PHASE BUSDUCTS	1	M/S KGS Engineering Limited
		2	L&T
		3	SIEMENS
		4	ALSTOM LTD.
		5	BEST & CROMPTON
		6	BHEL
72	ISOLATED PHASE BUS-DUCT	1	BHEL
		2	SIMELECTRO, FRANCE
73	SURGE ARRESTOR (Less than 15 kV)	1	ELPRO
		2	CGL
		3	OBLUM
74	POST INSULATORS	1	BHEL
		2	ADITYA BIRLA INSULATORS
		3	MOULDED FIBRE GLASS PRODUCTS
		4	W.S. INDUSTRIES LTD,CHENNAI
75	DISK/PIN INSULATOR	1	BHEL
		2	ADITYA BIRLA INSULATORS



Sl. No.	Item Description	Vendor Name	
		3	IEC
76	MOOSE CONDUCTOR	1	HINDUSTAN VIDYUT PRODUCTS LTD., HARYANA
		2	GUPTA POWER INFRASTRUCTURE LTD., BHUBANESWAR
		3	HIREN ALUMINIUM Ltd., SILVASSA DADRA & NAGAR HAVELI
77	ALUMINIUM TUBE	1	HINDALCO INDUSTRIES LIMITED
		2	JINDAL ALUMINIUM LIMITED
		3	BALCO
78	STRUCTURE HARDWARE	1	DEEPAK FASTNERS LTD
		2	NAVEEN METAL INDUSTRIES, KOLKATA
		3	NEW INDIA ENGINEERING CORPORATION
79	LUGS	1	UNIVERSAL MACHINES
		2	COMET
		3	MAHAVEER ENGINEERING
		4	DOWELLS
		5	SUNIL & CO. PVT. LTD.
80	FAST BUST TRANSFER	1	AARTECH SOLONICS LTD, MP
		2	ABB
81	RAIL POLE	1	SAIL
		2	RINL
		3	TATA
82	FRP JUNCTION BOXES/ JUNCTION BOXES (POWER/CONTROL), LIGHTING JB	1	SCHNEIDER
		2	CONTROL DEVICE
		3	SWITCHING CIRCUIT
		4	JASPER ENGINEERS
		5	BAJAJ ELECTRICALS
		6	AJMER
		7	S B EIEC. EENGINEERING CORP. Ltd
		8	PYROTECH
		9	ENGG. CONSTRUCTION CORP.
		10	L&T
83	LOCAL STARTER PANEL, LOCAL CONTROL PANEL, LIGHTING PANEL, ACELP, DCELP	1	PYROTECH
		2	L&T
		3	CONTROL DEVICE
		4	SCHNEIDER
84	LIGHTING WIRE	1	ISI MARK



Sl. No.	Item Description	Vendor Name	
85	ACTUATOR	1	AUMA
		2	LIMITORQUE
86	CABLE for ROLLED -E-CHAIN	1	IGUS
87	CABLE GLAND	1	SUNIL & COMPANY
		2	ARUP ENGG. & FOUNDRY WORKS
		3	COMMET BRASS PRODUCTS
		4	ELECTROMAC INDUSTRIES
		5	BALIGA LIGHTING EQPT.
88	BAY CONTROL UNIT	1	ALSTOM
		2	SIEMENS
		3	ABB
89	TRANSFORMER BUSHING	1	ABB
		2	AREVA
		3	ALSTOM
		4	BHEL
90	EARTH LEAKAGE CB	1	SCHNEIDER
		2	L&T
		3	SIEMENS
		4	ABB
91	EARTH LEAKAGE RELAY [ELR] ALONG WITH CBCT	1	AREVA
		2	PRO'KDEVICES
92	PUSH BUTTON	1	BCH
		2	L&T
		3	SCHNEIDER
		4	SIEMENS
		5	TECKNIC CONTROL
		6	GE – POWER
		7	ABB
93	RELAYS (OTHER THAN INTERPOSING & NUMERICAL RELAYS)	1	ABB
		2	AREVA
		3	SIEMENS
		4	GE – POWER
		5	ALSTOM
94	ENERGY MANAGEMENT SYSTEM	1	SCHNEIDER
		2	SECURE



Sl. No.	Item Description	Vendor Name	
	CONTROL & INSTRUMENTATION SYSTEM VENDORS		
1	DISTRIBUTED CONTROL SYSTEM	1	ABB
		2	HONEYWELL
		3	EMERSON
		4	VALMET (FORMERLY METSO)
2	PLC (Programmable Logic Controller)	1	ROCKWELL AUTOMATION INDIA LTD.
		2	GE
		3	SCHNEIDER ELECTRIC INDIA PVT.LTD.
3	DIGITAL INDICATOR	1	ABB
		2	GOSSEN / CAMILLE BAUER / METRAWATT
		3	YOKOGAWA
4	VERTICAL MOVING COIL INDICATOR	1	ABB
		2	GOSSEN
		3	CAMILLE BAUER
		4	METRAWATT
		5	YOKOGAWA
5	TRANSDUCERS	1	SIEMENS
		2	ABB
		3	CAMILLEBAUER
		4	ELSTER
		5	PYROTECH
		6	SOUTHERN TRANSDUCERS
		7	ADEPT
6	LARGE VIDEO SCREEN	1	BARCO
		2	PLANAR
7	PC	1	DELL
8	TFT MONITOR	1	DELL
		2	HP
		3	IBM-LENOVO
9	DOT MATRIX PRINTERS	1	EPSON
		2	TVS
10	PRINTERS (LASER)	1	HP
		2	IBM
11	COMPUTER FURNITURE	1	ADARSH CONTROLS
		2	COSMOS MEDIA
		3	FEATHER LITE
		4	GODREJ
		5	OTS



Sl. No.	Item Description	Vendor Name	
		6	PYROTECH
12	CONTROL PANEL/RACK	1	PYROTECH
		2	RITTAL
13	PRESSURE GAUGES	1	A. N. INSTRUMENTS PVT. LTD.
		2	ASHCROFT INDIA
		3	GENERAL INSTRUMENTS CONSORTIUM
		4	MANOMETER (INDIA) PVT.LTD
		5	WIKA
		6	FORBES MARSHALL LTD.
		7	GLUCK (INDIA) MFG.CO.
		8	WAAREE INDUSTRIES
		9	BUDENBERG GAUGE CO. LTD.
14	PRESSURE SWITCHES	1	ASHCROFT INDIA
		2	INDFOS INDUSTRIES LTD.
		3	SOR INC.
		4	SWITZER INSTRUMENT CO.
		5	TRAFAG-INDIA
		6	DELTA CONTROLS LTD.
15	ELECTRONIC TRANSMITTER	1	EMERSON PROCESS
		2	HONEYWELL
		3	YOKOGAWA
		4	FUJI
16	TEMPERATURE GAUGE	1	A. N INSTRUMENTS PVT. LTD.
		2	ASHCROFT INDIA
		3	GENERAL INSTRUMENTS CONSORTIUM
		4	GOA THERMOSTATIC INSTUMENTS
		5	WIKA
		6	FORBES MARSHALL
		7	WAREE
17	TEMPERATURE SWITCH	1	GENERAL INSTRUMENTS CONSORTIUM
		2	INDFOS INDUSTRIES LTD.
		3	SWITZER INSTRUMENT CO.
		4	AN INSTRUMENTS
18	TEMPERATURE ELEMENT	1	DETRIVE
		2	GENERAL INSTRUMENS CONSORTIUM



Sl. No.	Item Description	Vendor Name	
		3	INDUSTRIAL INSTRUMENTS
		4	PYRO ELEC INSTRUMENTS GOA P. LTD.
		5	TEMPSENS INSTRUMENTS (I) PVT. LTD.
19	ROTA METER	1	EUREKA
		2	FLUIDYNE INSTRUMENTS
		3	IEPL
		4	PLACKA INSTRUMENTS INDIA PVT. LTD.
		5	TRAC
20	SIGHT FLOW INDICATOR	1	CHEMTROLS SAMIL
		2	LEVCON INSTRUMENTS PVT. LTD.
		3	V.AUTOMAT & INSTRUMENTS PVT LTD.
		4	FORBES MARSHALL LTD.
21	FLOW SWITCH	1	GENERAL INSTRUMENTS CONSORTIUM
		2	KROHNE MARSHALL
		3	SWITZER INSTRUMENT CO.
22	IMPACT HEAD TYPE ELEMENT	1	DETREICH / EMERSON PROCESS
		2	MIDWEST
		3	STARMECH
		4	SWITZER INSTRUMENT CO.
		5	VERIS INC.
23	LEVEL GAUGE	1	CHEMTROLS ENGG. (P) LTD.
		2	LEVCON INSTRUMENTS (P) LTD.
		3	S. B. ELECTRO-MECHANICALS PVT. LTD.
		4	V. AUTOMAT & INSTRUMENTS PVT. LTD.
		5	DK INSTRUMENTS
		6	SIGMA INSTRUMENTS COMPANY
24	LEVEL SWITCH (FLOAT TYPE)	1	CHEMTROLS
		2	MAGNETROL INTERNATIONAL NV
		3	DK INSTRUMENTS
		4	LEVCON INSTRUMENTS P LTD.
25	LEVEL SWITCH (CONDUCTIVITY TYPE)	1	LEVEL STATE, UK
		2	SOLARTON/MOBREY, UK
		3	YARWAY
26	LEVEL SWITCH	1	ENDRESS + HAUSER



Sl. No.	Item Description	Vendor Name	
	(CAPACITANCE TYPE)	2	DK INSRTUMENTS
27	LEVEL SWITCH (DISPLACEMENT TYPE)	1	DRESSER VALVES INDIA LTD.
		2	CHEMTROLS
		3	DK INSRTUMENTS
		4	ECKARDT
28	LEVEL TRANSMITTER (ULTRASONIC TYPE)	1	EMERSON PROCESS
		2	ENDRESS + HAUSER
		3	SIEMENS MIL TRONICS
		4	VEGA
29	LEVEL TRANSMITTER (RADAR Type)	1	ENDRESS + HAUSER
		2	VEGA
30	BUNKER/SILO LEVEL 3D MONITORING (ULTRASONIC TYPE)	1	E & H
		2	SIEMENS
		3	VEGA-GERMANY
31	VIBRATION MONITORING SYSTEM /TURBINE SUPERVISORY MONITORING SYSTEM	1	GE (for BENTLY NEVADA SYSTEM)
		2	MEGGIT
		3	SHINKAWA, JAPAN
32	MERCURY MONITORING	1	DURAG GMBH AND CO KG
		2	SICK
		3	SHINKAWA
33	Dust Density Monitor	1	CODEL INTERNATIONAL LTD.
		2	DURAG GMBH AND CO KG
		3	LAND INSTRUMENTS INTERNATIONAL
		4	SICK GMBH
34	CO Analyzer (in situ type)	1	CODEL INTERNATIONAL LTD.
		2	LAND INSTRUMENTS INTERNATIONAL
		3	SICK GMBH
35	Oxygen Analyzer (Zirconia Probe type)	1	EMERSON PROCESS MANAGEMENT
36	SO ₂ -NOx/CO/CO ₂ Analyzer(Insitu Type)	2	CODEL INTERNATIONAL LTD
		3	PROCAL
		4	SICK GMBH
37	SWAS system (with selected analysers from Rosemount Analytical / Hack Ultra-France, Orion – USA, Hach-USA. ABB – UK, Polymetron- France/Zeltwegger -Analyticals)	1	ABB LTD.
		2	EMERSON PROCESS MANAGEMENT INDIA PVT.
		3	FORBES MARSHALL
38	DUST MONITOR	1	SIEMENS MILLTRONICS



Sl. No.	Item Description	Vendor Name	
		2	FILTER SENSE
		3	BIN MASTER
39	PULSE JET CONTROLLER	1	SWITCHING CIRCUIT
		2	ADVANCE CONCEPT
		3	VOLTCRAFT
		4	SQUARE M
		5	MICRO SYSTEM
40	AIR FILTER REGULATOR	1	JRU INSTRUMENTS (Formerly PLACKA)
		2	SHAVO NORGREN (INDIA) PVT. LTD.
41	ELECTRO PNEUMATIC CONTROLLER	1	MTL INDIA PVT. LTD.
		2	WATSON SMITH LTD.
		3	FAIRCHILD
42	SMART POSITIONER	1	EMERSON PROCESS MANAGEMENT
		2	SIEMENS
		3	ABB
43	SOLENOID VALVE	1	ASCO (I) LTD.
		2	ROTEX AUTOMATION LTD.
		3	NUCON INDUSTRIES PVT LTD
44	FEP INSULATED CABLE (For TG control)	1	DELTON CABLES
		2	HABIA CABLES
		3	LAPP CABLES
		4	LEONI KERPEN
		5	TEMPENS INSTRUMENTS (I) PVT. LTD.
		6	THERMOELECTRIC
45	PTFE INSULATED CABLES (For TG control)	1	ADVANCE CABLES TECHNOLOGIES
		2	DELTON CABLES
		3	FLUTEF INDUSTRIES
		4	RELIANCE INDUSTRIES
		5	RJ INDUSTRIAL CORPORATION
		6	TEMPSENS INSTRUMENTS (I) PVT. LTD.
		7	TOSHNIWAL CABLES PRIVATE LTD
		8	UNIVERSAL CABLES LIMITED
46	INSTRUMENTATION CONTROL CABLE/ COMPENSATING CABLE / THERMOCOUPLE EXTENSION CABLES	1	ADVANCE CABLES TECHNOLOGIES
		2	CORDS CABLE INDUSTRIES PVT. LTD.
		3	DELTON CABLES LTD.
		4	HABIA CABLES
		5	KEI INDUSTRIES LTD.
		6	KERPEN CABELS



Sl. No.	Item Description	Vendor Name	
		7	LAPP CABLES
		8	NICCO CABLE
		9	POLYCAB WIRES PVT.LTD
		10	THERMO CABLES LTD.
		11	THERMO ELECTRIC
		12	UNIVERSAL CABLES LTD.
47	POWER CABLE (LT)	1	CCIL
		2	KEI INDUSTRIES LTD.
		3	POLYCAB
		4	RELIANCE ENGRS.
		5	THERMO ELECTRIC
		6	ADVANCE CABLES TECHNOLOGIES
		7	RELIANCE ENGRS.
		8	CORDS CABLES
		9	DELTON CABLES
		10	INCAB
		11	PARAMOUNT CABLES
		12	RADIANT CABLES
		13	TORRENT
		14	UNIVERAL CABLES
48	FO CABLES	1	SYSTIMAX
		2	TYCO/AMP
		3	MOLEX
49	UPS & ACDB	1	EMERSON NETWORK
		2	MERLINEGERINE
		3	HITACHI HIREL ELECTRONICS
50	24 V DC BATTERY CHARGER & DCDB	1	CALDYNE
		2	CHHABI ELECTRICALS
		3	HBL POWER SYSTEMS
		4	DB POWER
51	HART COMMUNICATOR (HAND HELD)	1	EMERSON PROCESS
		2	YOKOGAWA
		3	ABB
		4	HONEYWELL
52	MASTER & SLAVE CLOCK SYSTEM	1	HATHWAY
		2	HOPF
		3	SERTEL ELECTRONICS
		4	MASIBUS



Sl. No.	Item Description	Vendor Name	
53	PUBLIC ADDRESSING SYSTEM (ANALOG SYSTEM)	1	BOSCH SECURITY SYSTEMS
	PUBLIC ADDRESSING SYSTEM (IP ADDRESSABLE)	2	STENTOFONE (from ZENITAL GROUP)
		3	INDUSTRONIC
		4	COMMEND
54	EPABX	1	ABB INDIA PVT. LTD.
		2	BPL TELECOM PVT. LTD.
		3	CROMPTON GREAVES LTD.
		4	HCL INFINET LTD.
		5	SIEMENS LTD.
		6	ABC INDIA PVT LTD.
55	CCTV System	1	BOSCH
		2	HONEYWELL
		3	PELCO
56	LIE/LIR	1	CHEMIN CONTROLS
		2	ELECTRONICS CORP. OF INDIA LTD.
		3	PYROTECH
		4	FORBES MARSHAL
		5	INSTRUMENTATION LIMITED
		6	PRAMMEN INDUSTRIES
57	CONDENSATE POTS	1	FLOWTECH
		2	INSTRUMENTATION LIMITED
		3	PRECISION ENGG INDUSTRIES
		4	BALDOTA VALVE AND FITTING CO. PVT LTD.
		5	METPRESS ENGINEERING WORKS
		6	MICROPRECISION
58	IMPULSE PIPES	1	BHARAT HEAVY ELECTRICALS LTD.
		2	INDIA SEAMLESS METAL TUBES LTD. (only for CS Pipes)
		3	JINDAL SAW PIPES LTD.
		4	MAHARASHTRA SEAMLESS (only for CS Pipes)
		5	MANNESMANN AG
		6	SUMITOMO CORPORATION
		7	TPS TECHNITUBE ROHREN WERKE GMBH
		8	TROUVAY CAUVIN GULF E.C. DUBAI
		9	BALDOTA VALVE AND FITTING CO. PVT. LTD.



Sl. No.	Item Description	Vendor Name	
		10	BHARAT HEAVY ELECTRICALS LTD.
		11	EXCEL HYDRO – PHEUMATICS PVT. LTD.
		12	INSTRUMENTATION LTD.
		13	METPRESS ENGINEERING WORKS
		14	MAHALAKSHMI SEAMLESS
		15	RATNAMANI METALS & TUBES LTD.
59	INSTRUMENT VALVES / MANIFOLDS	1	BHARAT HEAVY ELECTRICALS LTD.
		2	BALDOTA VALVE AND FITTING CO PVT LTD.
		3	INSTRUMENTATION LIMITED
		4	METPRESS ENGINEERING WORKS
		5	EXCEL HYDRO-PNEUMATICS PVT. LTD.
		6	METPRESS ENGINEERING WORKS
		7	FLOWTECH
60	COMPRESSION FITTINGS	1	PARKER HANNIFIN
		2	PRECISION ENGG INDUSTRIES
		3	TROUVAY & CAUVIN
		4	HOKE (TECHNICAL PARTS CO. MUMBAI)
		5	SWAGELOCK
		6	METPRESS ENGINEERING WORKS
61	SOCKET WELD FITTINGS	1	EXCEL HYDRO-PNEUMATICS PVT. LTD.
		2	METPRESS ENGINEERING WORKS
		3	V.K. INDUSTRIES
		4	VIKAS INDUSTRIAL PRODUCTS
		5	BALDOTA VALVE AND FITTING CO PVT LTD.
		6	FLOWTECH
FIRE DETECTION AND HYDRANT SYSTEM VENDORS			
1	HYDRANT VALVES	1	SHAH BHOGILAL
		2	SUKAN
		3	NEWAGE
		4	VENUS
		5	WINCO
2	FIRE HOSES	1	NEWAGE
		2	CHATTARIA RUBBER
3	WATER MONITOR & WATER-	1	SHAH BHOGILAL



Sl. No.	Item Description	Vendor Name	
	CUM FOAM MONITORS	2	HD FIRE
		3	NEW AGE
		1	SUKAN
		2	VENUS
4	BRANCH PIPE, NOZZLES, COUPLINGS & FIRE BRIGDAE CONNECTIONS	3	NEW AGE
		4	WINCO
		1	HD FIRE
		2	TYCO (GRINELL)
5	DELUGE VALVES	3	KIDDE (I) LTD.
		1	KIDDE (I) LTD.
		2	TYCO
6	HVW/ MVW SPRAY NOZZLE	3	HD FIRE
		1	TYCO(GRINELL)
		2	HD FIRE
7	QUARTZOID BULB SPRINKLERS/DETECTORS	3	NEWAGE INDUSTRIES
		1	ARC WELD ENGINEERS
		1	SIMPLEX
8	HYDRO PNEUMATIC TANK	2	SCHRACK
		3	ESSER HONEYWELL
		4	DETECTOMAT
		5	SECUTRON
		6	GENT
		1	AP SENSING, Germany
9	LHS CABLE (FO Type)	2	SENSA, UK
		1	Listec (Schrack)
10	LHS CABLE (Intelligent Addressable Thermal Sensor Based)	1	DEL PD PUMPS & GEARS
11	FOAM PUMP	1	ARC WELD ENGINEERS
12	FOAM TANKS	1	SIMPLEX
13	ADDRESSABLE MULTISENSOR TYPE DETECTORS	2	SCHRACK
		3	ESSER HONEYWELL
		4	DETECTOMAT
		5	SECUTRON
		6	GENT
		1	SIMPLEX
14	ADDRESSABLE PHOTO ELECTRIC TYPE DETECTORS	2	SCHRACK
		3	ESSER HONEYWELL
		4	DETECTOMAT
		5	SECUTRON
		1	SIMPLEX



Sl. No.	Item Description	Vendor Name	
		6	GENT
15	ADDRESSABLE HEAT DETECTORS	1	SIMPLEX
		2	SCHRACK
		3	ESSER HONEYWELL
		4	DETECTOMAT
		5	SECUTRON
		6	GENT
16	INFRA RED DETECTORS	1	PATOL
		2	SYSTEM SENSOR
17	COATING & WRAPPING MATERIAL/ TAPE (COAL TAR BASED)	1	IWL LTD.
		2	RUSTECH
18	INERT GAS SYSTEM	1	GINGEKERR
		2	ANSUL
		3	SRI
		4	SIEMENS
19	BATTERY	1	EXIDE
		2	AMCO
20	FIRE SURVIVAL CABLES	1	POLYCAB
		2	RRKABEL
		3	KEI
		4	DELTON
21	HOSE REEL	1	SIEMENS
		2	WINCO
23	FIRE EXTINGUISHER	1	BIS APPROVED SOURCES WITH VALID LICENSE
24	PROBE TYPE HEAT DETECTOR	1	KIDDE
		2	TYCO
HVAC SYSTEM VENDORS			
1	AIR WASHER & UAF	1	HYDERABAD POLLUTION CONTROL
		2	ADVANCE VENTILATION
		3	DRAFT AIR
		4	BLUE STAR
		5	VOLTAS
		6	STERLING WILSON
		7	ROOTS COOLING SYSTEM
		8	C DOCTOR
2	CENTRIFUGAL FAN	1	FLAKT
		2	KRUGER



Sl. No.	Item Description	Vendor Name	
		3	DRAFT AIR
		4	HYDERABAD POLUTION CONTROL
		5	ADVANCE VENTILATION
		6	PATEL AIR
		7	MARATHON
		8	CB DOCTOR
		9	SARLA
3	FRESH AIR/ SUPPLY/ EXHAUST/ RE UNIT FANS / PROPELLAR	1	HYDERABAD POLUTION CONTROL
		2	ADVANCE VENTILATION
		3	KRUGER
		4	NICOTRA
		5	MARATHON
		6	FLAKT
		7	CB DOCTOR
		8	KHAITAN
4	PUMPS	1	BEST & CROMPTON
		2	JYOTI
		3	SAM TURBO
		4	KBL
		5	KSB
		6	M&P
		7	VOLTAS
		8	WORTHINGTON
		9	FLOWMORE
		10	SULZER PUMPS INDIA LTD.
		11	FLOWSERVE INDIA CONTROL PVT LTD
5	LV MOTORS (NON FLAME PROOF)	1	SIEMENS
		2	ABB
		3	CGL
		4	MARATHON
		5	KEC
		6	BHARAT BIJLEE
		7	NGEF
6	AIR FILTER	1	PUROLATOR
		2	FMI
		3	ANFILCO
		4	JOHN FOWLER
		5	SPECTRUM



Sl. No.	Item Description	Vendor Name	
		6	AIR TECH
		7	PUROMATIC
7	INSULTATION MATERIAL	1	BEARDSHEL
		2	ARMAFLEX
		3	LLOYDS
		4	UP TWIGA
		5	AEROCELL
8	FIRE DAMPER	1	TSC
		2	CARRYAIRE
		3	RAVISTAR (SYSTEM AIR)
9	GRILL/ DIFFUSER/ VOLUME CONTROL DAMPER	1	CARRYAIRE
		2	RAVISTAR (SYSTEM AIR)
10	HUMIDISTAT	1	JHONSON CONTROL
		2	HONEYWELL AUTOMATION
		3	PENN
11	SCREW CHILLER	1	CARRIER
		2	KIRLOSKAR
		3	DUNHAM BUSH
		4	BLUE STAR
		5	VOLTAS
		6	MCQUAY (DAIKIN)
		7	CLIMAVENETA
12	PRECISION AC	1	STULZ
		2	UNIFLAIR
		3	BLUEBOX
		4	EMERSON PROCESS MANAGEMENT
		5	CLIMAVENETA
13	SPLIT AC	1	VOLTAS
		2	BLUE STAR
		3	CARRIER
		4	HITACHI
		5	DAIKIN
		6	LG
14	AIR HANDLING UNITS	1	VOLTAS
		2	BLUE STAR
		3	ZECO
		4	CARRYAIRE (flakt)
		5	EDGETECH



Sl. No.	Item Description	Vendor Name	
		6	ETHOS
		7	SYSTEM AIR
		8	WAVES AIRCON
15	AHU FAN (CENTRIFUGAL FAN)	1	CB DOCTOR
		2	FLAKT
		3	KRUGER
		4	NICOTRA
		5	COMEFRI
		6	MARATHON
		7	ADVANCE
		8	DRAFT AIR
		9	HYDERABAD POLLUTION
16	PUMPS	1	BEST & CROMPTON
		2	JYOTI
		3	SAM TURBO
		4	KBL
		5	KSB
		6	M&P
		7	VOLTAS
		8	BEACON-WEIR
		9	WORTHINGTON
		10	FLOWMORE
		11	SULZER PUMPS INDIA LTD.
		12	FLOWSERVE INDIA CONTROL PVT LTD
		13	V-FLOW PUMPS & SYSTEMS CO
17	COOLING TOWER	1	PAHARPUR COOLING TOWER
		2	FLOWTECH
		3	BELL
18	LV MOTORS (NON FLAME PROOF)	1	SIEMENS
		2	ABB
		3	CGL
		4	MARATHON
		5	KEC
		6	BHARAT BIJLEE
		7	NGEF
		8	JYOTI
19	AIR FILTER	1	PUROLATOR



Sl. No.	Item Description	Vendor Name	
		2	FMI
		3	ANFILCO
		4	TENACITY
		5	JOHN FOWLER
		6	SPECTRUM
		7	AIR TECH
		8	PUROMATIC
20	BALANCING VALVE	1	ADVANCE
21	4 WAY MIXING VALVE WITH ACTUATING MOTOR	1	SIEMENS BUILDING TECHNOLOGY
		2	JOHNSON
		3	BELIMO
		4	HONEYWELL AUTOMATION
		5	RAPID CONTROL
		6	ALC
22	Y / POT STRAINER	1	MULTITEX
		2	GREAVES COTTON
		3	JAYPEE
		4	SANT VALVES
		5	OTOKLIN
		6	GUJARAT OTOFILT
		7	DS ENGG
		8	SAROJINI ENTERPRISE
		9	BHATIA ENGINEERING
		10	FILTRATION ENGINEERS INDIA PVT LTD
23	STRIP HEATER	1	ESCORTS
		2	RACOLDS
		3	ALCO
		4	HEATCO
24	PAN HUMIDIFIER	1	RAPID COOL
		2	HOTSET
		3	ALCO
25	RELIEF / PURGE VALVE	1	BRASSOMATIC
26	THERMOSTATS	1	HONEYWELL AUTOMATION
		2	RANCO
		3	PENN
		4	DANFOSS
		5	RANUTROL
		6	INDFOSS JHONSON CONTROL



WBPDCL

Annexure-I

Sl. No.	Item Description	Vendor Name	
27	ANTI FREEZE THERMOSTAT	1	RANCO
		2	HONEYWELL AUTOMATION
		3	PENN
		4	DANFOSS
		5	INDFOSS
28	RH SENSOR/TEMP SENSOR	1	HONEYWELL AUTOMATION
		2	JOHNSON
		3	SIEMENS
		4	GENERAL INSTRUMENT CONSORTIUM
29	WATER SOFTENING PLANT	1	THERMAX
		2	ION EXCHANGE



**ANNEXURE#7
of
TECHNICAL ENQUIRY SPECIFICATION
for
Coal Handling Plant Conveyor System**

**for

SAGARDIGHI THERMAL POWER PROJECT
1 x 660 MW UNIT NO. 5, PHASE – III
WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED**

Content:

- Technical Data Sheet (to be filled by bidders)
- Guaranteed Auxiliary Power (to be declared by bidder)



TECHNICAL PROPOSAL PARTICULARS

FOR

COAL HANDLING SYSTEM

CONVEYOR PACKAGE

CONTENTS

ANNEXURE#7 TECHNICAL PARTICULARS – MECHANICAL

CONTENTS

DESCRIPTION

1. General
2. Belt Conveyor Drives
3. Belt
4. Idlers
5. Pulleys
6. Gear Box
7. Fluid Coupling
8. Flexible Couplings
9. Brakes for Conveyors
10. Belt Cleaners
11. Belt Protection Switches
12. Chutes, Hoppers & Skirt Board
13. Roller Screen
14. Crusher (Ring Granulator)
15. Belt Feeder/Reversible Belt Feeder
16. Rod Gate
17. Rack & Pinion Gate
18. Flap Gate (Electric / Pneumatic operated)
19. Motorized Diverter gate
20. Suspended Magnet (SEM)
21. In-line Magnetic Separator



22. Metal Detector
23. Belt Weigher
24. Fixed Tripper
25. Motorized Travelling Tripper
26. Bunker Sealing Arrangement
27. Sump Pump
28. Manual Hoist
29. Electric Hoist
30. Service Water & Drinking Water
31. Coal Sampling Unit
32. Service Air
33. Painting
34. DE, DS & Ventilation System
35. Air Compressor
36. Elevator



GENERAL

**BIDDER'S
CONFIRMATION/REPLY**

- 1.0.0 Conveyor & feeder length, lift & motor power shall be decided during detail engineering subject to purchaser's approval conforming to NIT requirements. Please confirm.
- 2.0.0 Confirm that suitable cross-overs with ladders shall be provided on conveyors as per NIT
- 3.0.0 Confirm that interfacing provisions as asked for in NIT shall be provided by bidder after doing proper engineering for the same subject to Purchaser's approval.
- 4.0.0 Confirm that special provisions relating to fire protection system shall be provided by bidder as asked for in NIT.
- 5.0.0 Confirm that the painting of mechanical equipment shall be done as per NIT.
- 6.0.0 Confirm that the fill of lubricants till commissioning & handing over of the plant is included in bidder's scope of work.
- 7.0.0 Please confirm that the commissioning spares will be included in bidder's scope and a full set of the same shall be handed over to the plant owner.
- 8.0.0 Confirm that necessary screw conveyor/flap gate etc. for discharge of dust back to the conveying system has been included as per NIT requirement.
- 9.0.0 Confirm that deviations taken if any, has been indicated in respective technical & commercial deviation schedules only.
- 10.0.0 Confirm that any data asked for in this schedule if not furnished shall be subject to purchaser's approval during detailed engineering.



**BELT CONVEYOR DRIVES
(FOR EACH CONVEYOR)**

- 1.0.0 Type of Drive :
- 2.0.0 Direction of Conveyor Travel :
Unidirectional/Reversible
- 3.0.0 No. of Drive Motors/Hyd. Drive :
- 4.0.0 Rating of Drive Motors at design ambient temp. :
(50 Deg.C)
- 5.0.0 Location of Drive Motor / Hydraulic Drive :
- 6.0.0 Type of Gear Box , if applicable :
- 7.0.0 Type of Input Coupling, if applicable :
- 8.0.0 Type of Output Coupling, If applicable :
- 9.0.0 Take-up
- 9.1.0 Type & location :
- 9.2.0 Take-up weight material :
- 9.3.0 Take-up travel :
- 10.0.0 Whether conveyor power & tension calculations
have been done as per latest edition of CEMA : Yes/No
- 11.0.0 Belt Power at Rated & Design Capacity :
- 12.0.0 Margin in Motor Power kept over belt power for
design capacity :
- 13.0.0 Drive equipment furnished considering
future requirement wherever applicable : Yes/No
- 14.0.0 Safe belt radius considered to avoid lifting during
part loaded/empty start without the help of
hold-down pulley (wherever applicable) : Yes/No



BELT

1.0.0 Manufacturer	:
1.1.0 Designation (for Conv.No.)	:
1.2.0 Capacity (TPH)	:
1.3.0 Width (mm)	:
1.4.0 Belt Geometry	:
1.4.1 Profile Length of Belt (M) for Conv. No.	:
1.4.2 Maxm. angle of inclination (deg) (Approx)	:
1.4.3 Total Lift (M)	:
1.4.4 Is belt flat or troughed?	:
1.4.5 Troughing angle (deg)	:
1.4.6 Type of belt joints	:
1.5.0 Grade of belt & relevant standard	:
1.6.0 Belt material	:
1.7.0 Belt type/ no. of plies	:
1.8.0 Weight of Belt/Metre Length (Kg)	:
1.9.0 Length per splice (M)	:
1.10.0 Belt cover	
1.10.1 Thickness of cover	
Top (mm)	:
Bottom (mm)	:
1.10.2 Cover grade	:

BELT

- 1.10.3 Cover thickness provided considering loading cycle & weight of belt to have safe belt radius to prevent lifting : Yes/No
- 1.11.0 Belt speed (M/Min) :
- 1.12.0 Maxm. belt tension (actual) (KN) :
- 1.13.0 Belt tension (allowable) (KN) :
- 1.14.0 Type of material handled
- 1.14.1 Lump size :
- 1.14.2 Moisture content :
- 1.14.3 Temperature :
- 1.14.4 Bulk density of material :
- 1.15.0 Type of Construction of belt edge :
- 1.16.0 Due considerations given in selection of belt for starting & braking condition : Yes/No
- 1.17.0 Leaflet/Catalogue enclosed : Yes/No

IDLERS

1.0 Type	Carrying	Impact	Return	Self aligning Idlers		Non-magnetic idlers		Transition
				Carrying	Return	Carrying	Return	

- 2.0 Manufacturer :
- 2.1 Type & Catalogue No. :
- 2.2 Roller Material :
- 2.3 Outer diameter (mm) & length of roller (mm):
- 2.4 Shaft Diameter at bearing & Material of Shaft:
- 2.5 Shell thickness (mm) :
- 2.6 Thickness of rubber disc(mm)
(Fill-up as applicable) :
- 2.7 Material of rubber discs. of idlers
(Fill-up as applicable) :
- 2.8 Maxm. spacing, (mm) :
- 2.9 Make, type of bearings, and life (hours) :
- 2.10 Type of lubrication :
- 2.11 Belt width for which suitable (mm) :
- i) For Convs. :
- ii) For Belt Feeders :
- 2.12 Troughing angle (deg) :
- 3.00 Belt Speed :
- 4.00 Capacity (TPH) :
- 5.00 Applicable Standard :
- 6.0.0 Whether all required quantities of
various types of idlers provided : Yes/No



IDLERS

- 7.00 Whether non-magnetic idlers provided under Magnetic Separators :
- 8.00 No. of non-magnetic idlers
- i) Carrying :
- ii) Return :
- 9.00 No. of impact idlers per feed point. :
- 10.0 Hours of operation per day :
- 11.0 Whether idlers are dust & water-proof : Yes/No
- 12.0 Maximum allowable friction factor during shop test :
- 13.0 Continuous impact idler provided in carrying side of Belt Feeders : Yes/No
- 14.0 Leaflet/Catalogue furnished : Yes/No

PULLEYS

- 1.0 Conveyor Nos. (fill-up as applicable) :
- (fill-up as applicable)
- 2.0 Manufacturer :
- 3.0 Quantity of Pulley per Conveyor set
(Fill-up as applicable)
Write against various types of Pulley as
- a) Drive pulley :
- b) Tail pulley :
- c) Head snub pulley :
- d) Tail snub pulley :
- e) Bend pulley :
- f) Take-up pulley :
- g) Deflector/Idler roller :
- 4.0 Pulley size (mm) (Dia x face width x shaft diameter at middle x bearing dia x shell thickness)
[Mention against various types of pulley]
- a) Drive pulley :
- b) Tail pulley :
- c) Head snub pulley :
- d) Tail snub pulley :
- e) Bend pulley :
- f) Take-up pulley :
- 4.1 Does pulley diameter selection conforms to higher of size of belt manufacturer's recommendation & IS stipulation : Yes/No

PULLEYS

- 5.0 Construction features :
- 5.1 Type of construction :
- 5.2 Crowning details (if any) :
- 5.3 For which pulleys crowning provided :
- 5.4 Follows which standard :
- 6.0 Material of construction
 - i) Shell :
 - ii) Disc :
 - iii) Hub :
 - iv) Shaft :
- 7.0 Lagging
 - i) Material :
 - ii) Thickness & pattern for drive pulleys :
 - iii) How lagging is secured :
 - iv) Hardness of lagging material :
- 8.0 Type of bearings :
- 9.0 Bearing life (hours) :
- 10.0 Type of lubrication :
- 11.0 Type of plummer block :
- 12.0 No. & size of hold-down bolts per plummer block
 - i) For drive pulleys :
 - ii) For rest of pulleys :

PULLEYS

12.1 Bearing Cengre to Centre distance (mm):

13.0 Middle diaphragm provided : Yes/No

14.0 All the pulleys are designed
considering the proper data : Yes/No

15.0 Due consideration for starting
condition of Conv. Made : Yes/No

16.0 Details of fixing arrangement
between the pulley hub and
pulley shaft :

17.0 Input shaft extension with
finished key & key-way
provided for drive pulleys : Yes/No

18.0 Idler pulleys/deflector
pulleys offered as per NIT : Yes/No

19.0 Shaft diameters of pulleys
shall be finalised during
detail engineering subject
to Purchaser's approval of
relevant calculations. : Yes/No

20.0 Pulley diameter has been
selected either by belt manufacturer's
recommendation or as per IS,
whichever is higher. : Yes/No

21.0 Catalogue enclosed : Yes/No

22.0 GD Sq. value of rotating
parts (Kg.Sq.M) :

23.0 Weight of pulleys (Kg) :



GEAR BOX

- 1.0 Conveyors Nos. :
- 2.0 Manufacturer & model no. :
- 3.0 Type :
- 4.0 Reduction Ratio (Nominal & Exact) :
- 5.0 Maximum allowable KW rating (Mechanical/Thermal) :
- 6.0 Mechanical efficiency (%) :
- 7.0 Type of Enclosure :
- 8.0 Bearing type & life :
- 9.0 Method of lubrication :
- 10.0 Type of primary coupling :
- 11.0 Type of secondary coupling :
- 12.0 Hold back provided : Yes/No
- 13.0 Details of Hold back :
- 14.0 Drive base frame provided : Yes/No
- 15.0 Materials of construction
- i) Casing :
- ii) Shaft :
- iii) Gear, pinion, worm etc. :
- 15.1 Gears & pinions hardened and ground : Yes/No



GEAR BOX

16.0 Duty conditions

i) No. of working hour per day :

ii) Indoor/Outdoor :

17.0 Due consideration for Conveyor starting made :

18.0 Whether Mech. rating of Gear Box is not less than 1.25 times the rating of its drive motor or 1.5 times the demand power at motor output considering design capacity or as per manufacturer's recommendation, whichever is higher. : Yes/No

19.0 Gear Boxes selected after thermal condition checking : Yes/No

20.0 Catalogue enclosed : Yes/No



FLUID COUPLINGS

- 1.0.0 Location :
(Mention Conv. No./Crusher No.)
- 2.0.0 Number required :
(Furnish location-wise)
- 3.0.0 Manufacturer :
- 4.0.0 Type :
- 5.0.0 Model Number :
- 6.0.0 Max. allowable KW transmitted :
(Mention equipment-wise)
- 7.0.0 Rated input speed (RPM) :
- 8.0.0 Rated slip (%) :
- 9.0.0 Whether oil quantity can be :
adjusted at site
- 10.0.0 Whether fusible plug provided :
- 11.0.0 Specification of filling oil :
- 12.0.0 Temperature at which plug :
fuses (deg.C)
- 13.0.0 Sq.GD of Coupling (Kg.-Sq.M) :
- 14.0.0 Weight of coupling :
(Both filled & unfilled) (Kg)
- 15.0.0 Type of semi-flexible/flexible :
coupling
- 16.0.0 Material of construction
- i) Impeller :
- ii) Runner :
- iii) Casing :



FLUID COUPLINGS

17.0.0 Spare fusible plug & resilient plate provided : Yes/No

18.0.0 Can fluid coupling be removed without shifting motor & gear box : Yes/No

19.0.0 At what percent of rated speed of motor the secondary side (i.e. load side) starts rotating at - :

i) Full load condition :

ii) No load condition :

20.0.0 Does the equipment suitable for full load & no load start considering safe acceleration and motor safety : Yes/No

21.0.0 Location & details of brake-drum, if applicable :

22.0.0 Leaflet/catalogue furnished : Yes/No

23.0.0 Fluid coupling shall be suitable to be used upto motor rated KW : Yes/No



**FLEXIBLE COUPLING
(PIN-BUSH & GEAR TYPE)**

1.0.0 Conv. No.	:
2.0.0 Manufacturer	:
3.0.0 Type of coupling	:
4.0.0 Power that may be transmitted safely under actual RPM (KW)	:
5.0.0 Service factor	:
6.0.0 Brake-drum provided (where applicable)	:
7.0.0 Size of Brake Drum Dia (mm) x Face width (mm)	:
8.0.0 Materials of Construction	:
8.1.0 Brake-drum	:
8.2.0 Hub	:
8.3.0 Flange	:
8.4.0 Retainer disc.	:
8.5.0 Pin	:
9.0.0 Whether designed to cater requirement of specification	: Yes/No
10.0.0 Weight (Kg)	:
11.0.0 GD ² (Kg.Sq.M)	:
12.0.0 Permissible Misalignment	:
12.1.0 Parallel	:
12.2.0 Angular	:
13.0.0 Leaflet/Catalogue furnished	: Yes/No.



BRAKES FOR CONVEYORS

- 1.0.0 Conveyor No. :
- 2.0.0 Type of Brake & Make :
- 3.0.0 Model No. :
- 4.0.0 Quantity provided :
- 5.0.0 Braking torque (Kg-m) :
- 6.0.0 Brake drum details :
- 6.1.0 Dia x Face-Width :
- 6.2.0 Material of construction of Brake Drum :
- 6.3.0 Location of Brake Drum with respect of drive system :
- 7.0.0 Material of construction of major parts :
- 8.0.0 Maximum no. of Stopping/
Tripping permissible per hour :
- 9.0.0 Operating voltage & frequency
with variations :
- 10.0.0 Electrical load demand (KW) :
- 11.0.0 Equipment weight (Kg) :
- 12.0.0 Physical limit switch for
brake release provided &
interlocked with main motor
where there is no fluid coupling? : Yes/No
- 13.0.0 Leaflet/Catalogue enclosed : Yes/No



BELT CLEANERS

- | | |
|---|----------|
| 1.0.0 Type of external cleaners
(Specify for each conveyor) | : |
| 2.0.0 Type of Internal Cleaners
(Specify for each Conveyor) | : |
| 3.0.0 Quantity of External Cleaners
provided for each Conveyor | : |
| 4.0.0 Quantity of Internal Cleaners
provided for each Conveyor | : |
| 5.0.0 Material of Blade for all
types of cleaners | : |
| 5.1.0 Thickness of Blade | : |
| 5.2.0 Length & width of Blades | : |
| 6.0.0 Scrap material chutes
provided for all cleaners | : Yes/No |
| 7.0.0 Catalogue & write-up | : Yes/No |
| 8.0.0 List of experience enclosed? | : Yes/No |



BELT PROTECTION SWITCHES**1.00.00 PULL CORD SWITCH**

- 1.01.00 Name of Manufacturer :
- 1.02.00 Type No. :
- 1.03.00 Contact Rating - Amps.
240 V A.C., 1 Ph. 50 Hz. : Continuous Breaking
- 1.04.00 Whether contacts silver plated : Yes/No
- 1.05.00 Maximum Spacing :
- 1.06.00 Contact pressure :
- 1.07.00 Dimension (L x B x H) mm :
- 1.08.00 Type of Construction :
- 1.09.00 Weight of complete switch :
- 1.10.00 Details of enclosure and its degree of protection :
- 1.11.00 Catalogue furnished? :

2.00.00 FOR BELT SWAY SWITCH

- 2.01.00 Name of the Manufacturer :
- 2.02.00 Type No. :
- 2.03.00 Contact Rating - Amps.
240 V A.C., 1 Ph. 50 Hz. : Continuous Breaking
- 2.04.00 Whether contacts silver plated : Yes/No
- 2.05.00 Maximum Spacing :
- 2.06.00 Contact pressure :
- 2.07.00 Deflection of the switch in operated condition from normal position :



BELT PROTECTION SWITCHES

2.08.00 Dimension (L x B x H) mm	:
2.09.00 Weight of complete switch	:
2.10.00 Details of enclosure and degree of protection	:
2.11.00 Whether bridging button provided at local push button stations?	: Yes/No
2.12.00 Catalogue furnished?	:
3.00.00 ZERO SPEED SWITCH	
3.01.00 Name of the Manufacturer	:
3.02.00 Type & Number offered	:
3.03.00 Contact Rating - Amps. 240 V A.C., 1 Ph. 50 Hz.	: Continuous Breaking
3.04.00 No.of contacts provided & Location	:
3.05.00 Whether contacts are Silver Plated	:
3.06.00 No. of Operation the Contacts can withstand	:
3.07.00 Dimension (L x B x H) mm	:
3.08.00 Mounting arrangement	:
3.09.00 Maxm. recommended sensing distance	:
3.10.00 Details of the control unit	:
3.11.00 Power Supply Details	:
3.12.00 Speed range	:
3.13.00 Type of enclosure and degree of protection	:
3.14.00 Catalogue furnished?	:



**CHUTES, HOPPER & SKIRT BOARD
(For Crushed and Uncrushed Coal)**

1.0.0 Chutes	:
1.1.0 Thickness of main plate (mm)	:
1.2.0 Material of main plate	:
1.3.0 Thickness of chute liner (mm)	:
1.4.0 Material of chute liner	:
1.5.0 Make of liner	:
1.6.0 How liner is secured with main plate.	:
1.7.0 Whether internal surfaces of chutes are provided with liner as per NIT.	: Yes/No
1.8.0 Min. valley angle of chutes (degree)	:
1.9.0 Inspection doors/poke doors provided near all bend points and at head-end chutes	: Yes/No
1.10.0 Min. Chute Size	:
1.11.0 Adequate rubber sealing provided at entry to head end exit from tail end	: Yes/No
1.12.0 Thickness of head end hood (mm)	:
2.0.0 Hoppers & Reject Bin	
2.1.0 Thickness of main plate (mm)	:
2.2.0 Material of main plate	:
2.3.0 Thickness of liner plate (mm)	:

**CHUTES, HOPPER & SKIRT BOARD
(For Crushed and Uncrushed Coal)**

2.4.0 Material of liner plate (mm)	:
2.5.0 How liner is secured with main chute plate.	:
2.6.0 Min., valley angle (degree)	:
2.7.0 Suitable stiffeners for structural adequacy provided.	: Yes/No
3.0.0 Skirt Board	
3.1.0 Thickness of main plate (mm)	:
3.2.0 Material of main plate	:
3.3.0 Thickness of skirt liner (mm)	:
3.4.0 Material of skirt liner	:
3.5.0 Skirt height x width	:
i) For Conveyors (mm)	:
ii) For Belt Feeders (mm)	:
3.6.0 Thickness of top cover on skirt (mm)	:
3.7.0 Material of top cover on Skirt	:
3.8.0 Min. length of skirt per feeding point (mm)	:
3.9.0 Whether continuous skirt between two consecutive nearby feeding points on same conveyor provided.	: Yes/No
3.10.0 Adequate dust seal/rubber curtain provided at exit point of skirts	: Yes/No

**CHUTES, HOPPER & SKIRT BOARD
(For Crushed and Uncrushed Coal)**

- 3.11.0 Thickness & hardness of skirt rubber (mm, oA) :
- 3.12.0 Type of fixing arrangement between main plate & liner :
- 4.0.0 a) Minm. working life of liners considering normal operation :
- b) Relevant calculations in support of guaranteed life furnished : Yes/No
- 5.0.0 Details of non-magnetic chute where applicable :
- 6.0.0 Details of tramp iron chute :



ROLLER SCREEN

- 1.0.0 Manufacturer :
- 2.0.0 Type :
- 2.1.0 Catalogue enclosed? : Yes/No
- 3.0.0 Quantity :
- 4.0.0 Capacity :
- 5.0.0 Material Input Size :
- 5.1.0 Max. moisture content of coal :
- 6.0.0 Screen undersize :
- 7.0.0 Drive details and KW rating :
- 8.0.0 Overall dimensions :
- 9.0.0 Inclination of screen :
- 10.0.0 Range of variation of capacity :
- 10.1.0 Method of variation of capacity :
- 11.0.0 Whether size of gap between rollers adjustable : Yes/No
- 11.1.0 Method of above adjustment & range, if applicable :
- 12.0.0 Material of construction & thickness :
- 12.1.0 Disc Roller Shaft :
- 12.2.0 Discs:
- 12.3.0 Longitudinal drive shaft :
- 12.4.0 Screen frame :
- 12.5.0 Frame liner :



ROLLER SCREEN

12.6.0 Feed & discharge chutes	:
12.6.1 Chute liner	:
13.0.0 Details of mounting arrangement	:
14.0.0 Details of vibration isolator provided	:
15.0.0 Details of bearings	:
15.1.0 Type & life of bearing	:
16.0.0 Noise level at a distance of 1 M & 1.5 M above floor level	:
17.0.0 Equipment weight	:
18.0.0 Is the equipment suitable for operating satisfactorily during monsoon	:
19.0.0 Whether drg. enclosed with offer	: Yes/No
20.0.0 Working principle of operation	:
21.0.0 Whether catalogue/leaflet/ write-up enclosed with offer	: Yes/No



CRUSHER (RING GRANULATOR)

1.0 Type	:
2.0 Make & Quantity	:
3.0 Model No.	:
4.0 Rotor dia x Rotor width	:
5.0 Capacity (MTPH)	:
6.0 RPM of Crusher	:
7.1 Input maxm. lump size (mm)	:
7.2 Moisture content of input lump	:
7.3 Guaranteed output lump size at specified input size & moisture content	:
8.0 Material of parts	:
8.1 Material of shafts	:
8.2 Material of casing	:
8.3 Material of breaker plate	:
8.4 Suspension bars	:
8.5 Ring hammer	:
8.6 Cage assembly	:
8.7 Internal parts in contact with coal including liners	:
9.0 Details of adjustment for governing product size	:
10.0 Details of casing opening	:
11.0 Screen analysis of output	:



CRUSHER (RING GRANULATOR)

12.0 Motor	:
12.1 Rating (KW) & operating voltage, frequency with variation	:
12.2 Speed (RPM)	:
12.3 Starting torque (KGM)	:
12.4 Whether as per Specification	: Yes/No
12.5 How coupled with crusher	:
12.6 Method of mounting	:
12.7 Direction of rotation	:
12.8 Quantity of motor	:
12.9 Margin over actual motor power required (%)	:
13.0 Specification of fluid coupling between motor and crusher	:
13.1 Type	:
13.2 Output torque	:
13.3 Quantity of coupling	:
14.0 Crusher bearing	:
14.1 Type	:
14.2 Life	:
14.3 Lubrication	:
14.4 Cooling arrangement	:



CRUSHER (RING GRANULATOR)

- 14.5 Whether dust tight :
- 14.6 Type of bearing seal :
- 14.7 Make & no. :
- 15.0 Hours of operation/day :
- 16.0 Whether crusher is suitable for given input material & rate of feed : Yes/No
- 17.0 Noise level at a distance of 1M & 1.5 M above floor level in decibels :
- 18.0 Power Consumption (KW/T) :
- 19.0 Weight of Crusher :
- 19.1 Total weight with Motor, Frame & Drive :
- 19.2 Rotor weight :
- 20.0 Speed switch & temperature scanner for both crusher & motor, vibration monitor as specified in specification included : Yes/No
- 21.0 How crusher is installed on VIS only : Isolated foundation / or viscous damper with building structure / on resilient damper with building structure (strike out whichever is not applicable).
- 22.0 Life of Hammers :
- 23.0 Catalogue of crusher enclosed : Yes/No



BELT FEEDER / REVERSIBLE BELT FEEDER

- 1.0.0 No. of Belt Feeder provided :
- 2.0.0 Name of Manufacturer :
- 3.0.0 Applicable Feeder Nos. :
- 4.0.0 Capacity (MTPH) :
- 5.0.0 Whether due consideration : Yes/No
given in design for material
shear effect below hopper
- 6.0.0 Length of Belt Feeder :
- 7.0.0 Width of Belt Feeder :
- 8.0.0 Speed of Belt Feeder :
- 9.0.0 Troughing Angle :
- 10.0.0 Skirt Height :
- 11.0.0 Drive Details -
- a) Type of Drive :
- b) Belt Power :
- c) Motor rating at 50 deg.C :
- d) Type of Gear Box for Drive :
- e) Type of Input Coupling :
- f) Type of Output Coupling :



BELT FEEDER / REVERSIBLE BELT FEEDER

12.0.0 Belt Details -

- a) Belt Width :
- b) Belt Designation :
- c) Whether Belt Specification conform to NIT : Yes/No
- d) Belt cover grade :
- e) Belt cover thickness :
- i) Top :
- ii) Bottom :
- f) Cover thickness provided considering loading cycle : Yes/No
- 13.0.0 Details of Idlers provided :
- 14.0.0 Details of pulleys provided :
- 15.0.0 Weather pull cord & zero speed switches provided : Yes/No
- 16.0.0 Type & travel of take-up :



ROD GATE

1.0.0 Make :

2.0.0 Location & Quantity :

3.0.0 Gates suitable for lump size & flow rate :

4.0.0 Size of Rods :

5.0.0 Spacing of Rods :

6.0.0 Frame Material :

7.0.0 Material of Rods :

8.0.0 Thickness of frame :



RACK & PINION GATE

1.0.0 Manufacture	:
2.0.0 Type, Quantity & Location	:
3.0.0 Gate Opening Size	:
4.0.0 Travel Speed (M/Sec.)	:
5.0.0 Detail of Drive with KW Rating	:
6.0.0 Bearings	
6.1.0 Type of Bearings	:
6.2.0 Type of Lubrication	:
6.3.0 Type of Dust Seal	:
7.0.0 Material of Construction	
7.1.0 Frame	:
7.2.0 Gate Plate (with thickness)	:
7.3.0 Gate Liner Material & Thickness	:
7.4.0 Rack	:
7.5.0 Pinions/Sector gears (as applicable)	:
7.6.0 Shafts	:
8.0.0 Type of Liner Fixing	:
9.0.0 Details of Hold Back & Brake	:



RACK & PINION GATE

- 10.0.0 Limit Switch Location & det. :
- 11.0.0 Details of Provision for Manual Operation :
- 12.0.0 Is the Gate suitable for intermediate position : Yes/No
- 13.0.0 Gate suitable for installing in both inclined and horizontal position : Yes/No
- 14.0.0 Hand wheel & chain shall rotate during motorised operation : Yes/No



FLAP GATES (ELECTRIC / PNEUMATIC OPERATED)

- 1.0.0 No. of Gates & their location :
- 2.0.0 Type :
- 3.0.0 Manufacturer :
- 4.0.0 No. of positions of gates :
- 5.0.0 Type of actuator :
- 5.1.0 Min. thrust of actuator (Kgf) :
- 6.0.0 Stroke length :
- 7.0.0 Speed of travel :
- 8.0.0 Type of bearings :
- 9.0.0 Type of lubrication arrangement :
- 10.0.0 Bearing life (Working hours) :
- 11.0.0 Supporting arrangement for gates and actuators :
- 12.0.0 Materials of construction
- i) Gate :
- ii) Chute :
- iii) Gate-liner :
- iv) Gate-shaft :
- 13.0.0 Whether the liners are replaceable type : (Yes/No.)
- 14.0.0 Weight (Kg., no. wise) :
- 15.0.0 Type and no. of limit switches per gate :



FLAP GATES (ELECTRIC / PNEUMATIC OPERATED)

- 16.0.0 Type of enclosure for limit switches :
17.0.0 The motors are as per Spec. : (Yes/No)
18.0.0 Voltage & frequency of operation with variations :
19.0.0 Electrical load (KW, gate no. wise) :
20.0.0 Facility for manual operation provided :
21.0.0 No. of switching/hour :
22.0.0 Facility for removing gate provided without dismantling major portion of chute : (Yes/No)
23.0.0 Catalogue enclosed : (Yes/No.)



MOTORIZED DIVERTER GATE

1.0.0 Does Diverter Gate conform to the requirements of specifications as per Tech Spec. : (Yes/No)

2.0.0 Type & make :

3.0.0 Travel speed of gate, mm/sec :

4.0.0 Alternate manual operation provided : (Yes/ No)

4.0.0 Effort required for manual operation, kgf :

5.0.0 MOC for Housing

6.0.0 MOC & thk, mm for Triangular prism body [of travelling gate] :

7.0.0 MOC for rack/pinion :

8.0.0 Type of bearing, its life, L10 ,hr :

9.0.0 Type of lubrication arrangement :

10.0.0 No of consecutive starts/ stops per hr :

11.0.0 No of switching per hr :

12.0.0 Motor kw rating & type :

13.0.0 Limit Switches Provided : (Yes/No.)

14.0.0 Estimated weight of one gate, (kgf)



SUSPENDED ELECTRO MAGNET (SEM)

- 1.0.0 Does Suspended Magnet conform to the requirements of specifications as per Tech Spec. : (Yes/No)
- 2.0.0 Type :
- 3.0.0 Manufacturer :
- 4.0.0 Qty/Location :
- 5.0.0 Operating height, mm :
- 6.0.0 Minimum wt. & size of tramp iron that can be picked from belt at specified operating height:
- 7.0.0 Maximum wt. & size of tramp iron that can be picked from belt at specified operating height:
- 8.0.0 Size of magnet,
mm x mm x mm [W x L x H] :
- 9.0.0 Force Index :
- 10.0.0 Gauss strength at specified operating height :
- 11.0.0 Required voltage (DC/AC) :
- 12.0.0 Material of Coil :
- 13.0.0 Type of cooling arrangement :
- 14.0.0 Rectifier
- 14.1.0 Type & make :
- 14.2.0 Input Power supply to Rectifier :
- 15.0.0 Material of magnet/ IS standard :
- 16.0.0 Tramp Iron Chute provided at operating floor : (Yes / No)



SUSPENDED ELECTRO MAGNET (SEM)

17.0.0 DC Power consumption
in hot condition, kw

17.1.0 After 24 hours of continuous
operation :

17.2.0 After 8 hours of continuous
operation :

18.0.0 Tramp Metal Trolley provided : (Yes / No)

19.0.0 Non-Magnetic Idlers as per Spec.
Provided : (Yes / No)

20.0.0 Total wt. of Suspended
Electromagnet, tonne. :

21.0.0 Reference arrangement
drawing/ catalog enclosed : (Yes / No)



IN-LINE MAGNETIC SEPARATOR

- 1.0.0 Type :
- 2.0.0 Manufacturer & model no. :
- 3.0.0 Number :
- 4.0.0 Location :
- 5.0.0 Whether the equipment will be able to separate tramp iron as per NIT. : Yes/No
- 5.1.0 Working gap between main belt & separator :
- 5.2.0 Main belt speed considered :
- 6.0.0 Type of drive system :
- 7.0.0 Speed of separator belt :
- 8.0.0 Width and material specification of separator belt :
- 9.0.0 Bearing particulars :
- 10.0.0 Weight of equipment :
- 11.0.0 Type and material of rectifier :
- 12.0.0 Material of magnetic coil :
- 13.0.0 Gauss strength of magnet at belt level after stabilisation :
- 14.0.0 Furnish the diagram showing the field of magnet of the equipment & variation with distance :
- 15.0.0 Total power required (KW) :
- 16.0.0 Method of bearing lubrication :



IN-LINE MAGNETIC SEPARATOR

- 17.0.0 Operating height from belt top surface (mm) :
- 18.0.0 Motor details :
- 19.0.0 Insulation class of magnet and panel :
- 20.0.0 Type of transformer cooling :
- 21.0.0 Rating of rectifier :
- 22.0.0 Min. starting voltage :
- 23.0.0 Tramp iron chute terminating with bin included : (Yes/No)
- 24.0.0 Gauss sensitive relay included : (Yes/No)
- 25.0.0 Details of Dust tight cover around the zone of discharge pulley & separator :
- 26.0.0 Suitable zero speed switch included : (Yes/No)
- 27.0.0 Separator belt suitable to withstand high temperature at magnet face & serious damage due to high impact of sharp edges of tramp iron : (Yes/No)
- 28.0.0 Catalogue enclosed : (Yes/No)



METAL DETECTOR

- 1.0.0 Manufacturer :
- 2.0.0 Model No. :
- 3.0.0 Type :
- 4.0.0 Nos. & location :
- 5.0.0 Aperture size :
- 6.0.0 Particulars of metal detectable-
- i) Min. size :
- ii) Corresponding metal :
- 7.0.0 Power Required (KW) :
- 8.0.0 Conveyor speed range in which metal detector is workable with adequate sensitivity. :
- 9.0.0 Sensitivity level at normal operating condition :
- 10.0.0 Sensitivity level at maximum moisture content of material. :
- 11.0.0 Total weight of the unit :
- 12.0.0 Operating voltage & frequency with variations. :
- 13.0.0 All necessary cabling panels, electricals, hooters etc. included : Yes/No
- 14.0.0 Protective device provided to guard equipment against oversize material : Yes/No
- 15.0.0 Type of Marker arrangement provided. :
- 16.0.0 Detector is dust & moisture proof : Yes/No
- 17.0.0 Leaflet/Catalogue furnished : Yes/No



BELT WEIGHER

1.0.0 Location	:
2.0.0 Quantity of Scale	:
3.0.0 Type	:
4.0.0 Make	:
5.0.0 Type of speed sensor	:
6.0.0 Type of load sensor	:
7.0.0 Details of local indication	:
7.1.0 Digital rate indicator provided	: Yes/No
7.2.0 Digital Totaliser provided	: Yes/No
8.0.0 Details of remote indication panel	:
8.1.0 Chart Recorder Provided	: Yes/No
8.2.0 Digital Totaliser provided	: Yes/No
8.3.0 Rate Indicator provided	: Yes/No
9.0.0 Guaranteed accuracy (%) of rated capacity	:
10.0.0 Calibration weight, test chain & chain reeling drum included	: Yes/No
11.0.0 Equipment is suitable for dusty atmosphere	: Yes/No
12.0.0 Weigh length (m)	:
13.0.0 Minm. weighing capacity (MTPH)	:
14.0.0 Maxm. weighing capacity (MTPH)	:
15.0.0 Average weighing capacity (MTPH):	



BELT WEIGHER

- 16.0.0 Type of power supply reqd. :
- Voltage, Phase, Frequency :
& Variations
- 17.0.0 Total load demand (KW) :
- 18.0.0 Machine weight :
- 19.0.0 I.P. protection class of panel :
- 20.0.0 The equipment suitable for : Yes/No
specified detail of conveyor.
- 21.0.0 Leaflet/Catalogue enclosed : Yes/No



FIXED TRIPPER

- 1.0.0 Does Fixed Tripper conform to the requirements as mentioned in Tech Spec.? : (Yes/ No)
- 2.0.0 Location/ Qty :
- 3.0.0 Type of belt cleaner provided :
- 4.0.0 Flap gate/ Skirt board/ other items as per spec. provided : (Yes/ No)
- 5.0.0 Belt width :
- 6.0.0 Discharge chute as per spec. Provided : (Yes/ No)
- 7.0.0 Access platform with ladders hand rail provided? : (Yes/ No)



MOTORIZED TRAVELLING TRIPPER

1.0.0 Manufacturer	:
2.0.0 Type, Qty. & Location	:
3.0.0 Capacity (T/hr.) & type of material handled	:
4.0.0 Travelling speed (m/sec.)	:
5.0.0 Type of drive	:
6.0.0 Method of reversing	:
7.0.0 Wheels	
7.1.0 No. & diameter/tripper	:
7.2.0 Wheel centre to centre	:
7.3.0 Type of bearings	:
7.4.0 Type of lubrication	:
7.5.0 Wheel material	:
7.6.0 Bearing life	:
8.0.0 Axle	
8.1.0 Bearing diameter	:
8.2.0 Axle material	:



MOTORIZED TRAVELLING TRIPPER

9.0.0 Rails

- 9.1.0 Recommended size :
- 9.2.0 Rail centre to centre with tolerance :
- 9.3.0 Necessary Qty. of Rail Provided : Yes/No

10.0.0 Pulleys

- 10.1.0 Diameter x Width :
- 10.2.0 Shell thickness & material :
- 10.3.0 Shaft dia at bearing with shaft material :
- 10.4.0 Detail of pulley lagging :
- 10.5.0 Type of bearing :
- 10.6.0 Bearing life & lubrication :
- 10.7.0 Bearing seal type :
- 10.8.0 Standard Applicable :

11.0.0 Gear Box

- 11.1.0 Type :
- 11.2.0 Rating :
- 11.3.0 Reduction ratio :
- 11.4.0 Material of shafts, gears & casing :
- 11.5.0 Lubrication with specification :



MOTORIZED TRAVELLING TRIPPER

12.0.0 Idlers	:
12.1.0 Type, troughing angle & spacing	:
12.2.0 Tube dia x shell thickness	:
12.3.0 Bearing type, size & life	:
12.4.0 Type of lubrication	:
12.5.0 Type of dust seal	:
12.6.0 Standard applicable	:
13.0.0 Belt cleaner provided	: Yes/No
14.0.0 Bunker Sealing Belt & other associated arrangement provided	: Yes/No
15.0.0 Conveyor Belt Width (mm) & Speed (r.p.m)	:
16.0.0 Total KW demand	:
17.0.0 Details of motor	:
18.0.0 Details of local panel with degree of protection	:
19.0.0 Details of trailing cable and cable reeling arrangement	:
20.0.0 Details of limit switches	:
21.0.0 Is the tripper suitable for required travel	: Yes/No
22.0.0 Hours of operation per day	:
23.0.0 Chute Work	
23.1.0 Plate thickness (mm)	:



MOTORIZED TRAVELLING TRIPPER

23.2.0 Liner thickness (mm)	:
23.3.0 No. of ways discharge can be made	:
24.0.0 Detail of brake	:
25.0.0 Type of flap gate	: Motorised/Manual.
26.0.0 Type of scraper	:
27.0.0 Tripper angle with horizontal	:
28.0.0 Rail clamp, end stop, etc. provided	: Yes/No
29.0.0 Does Tripper suitable for local & remote operation	: Yes/No
30.0.0 Does design of tripper takes care of self propelling due to differential belt tensions	: Yes/No
31.0.0 Continuous deck plate below carrying idlers provided	: Yes/No
32.0.0 Drive equipment suitable for duty of minimum 60 starts/hr.	: Yes/No
33.0.0 Thrustor operated rail clamp with manual provision provided	: Yes/No
34.0.0 Suitable hold down guide pulley over concave curve of belt provided	: Yes/No
35.0.0 Leaflet/Catalogue furnished	: Yes/No



BUNKER SEALING ARRANGEMENT

- 1.0.0 Belt Width (mm) :
- 2.0.0 Belt Designation :
- 3.0.0 No. of Ply of Belt :
- 4.0.0 Thickness of Coverings :
- 4.1.0 Top (mm) :
- 4.2.0 Bottom (mm) :
- 5.0.0 Cover Grade :
- 6.0.0 Length of Belt (M) :
- 7.0.0 Whether requisite quantity of belt included? : Yes/No
- 8.0.0 Detail of tensioning arrangement :



SUMP PUMP

- 1.0 Type :
- 2.0 Manufacturer & model no. :
- 3.0 Location & Quantity :
- 4.0 Discharge capacity
(Mention locationwise) :
- 5.0 Total Head
(Mention locationwise) :
- 6.0 NPSH required
(Mention locationwise) :
- 7.0 Type of mechanism for automatic
starting/stopping :
- 8.0 Strainer at impeller inlet provided : Yes/No
- 9.0 Sump level at starting/stopping :
- 10.0 Hours of operation/day :
- 11.0 Whether pump is capable
of handling slurry as stated
(Mention maximum particle
size in slurry) :
- 12.0 Material of construction
- 12.1 Casing :
- 12.2 Impeller :
- 12.3 Pump Shaft :
- 12.4 Line Shaft :
- 12.5 Support Pipe :
- 12.6 Cover Plate :



SUMP PUMP

12.7 Strainer	:
12.8 Head shaft	:
13.0 Lubrication	:
14.0 Type & lift of bearing	:
15.0 Weight of pump set	:
16.0 Efficiency of pump	:
17.0 Power required at duty point (Mention locationship)	:
18.0 Motor details (Mention locationwise)	:
19.0 Drive motors conform to NIT	: Yes/No
20.0 All necessary piping, fittings valves etc. upto nearest drain provided.	: Yes/No
21.0 Details of piping, fittings & valves	:
22.0 Local panel, necessary start/ stop push button, auto/manual selector switch etc. provided	: Yes/No
23.0 Settling velocity provided	:
24.00 Recommended dimensions of sump pit (mention locationwise)	:
25.0 Catalogue enclosed	: Yes/No



MANUAL HOIST

- 1.0 Type, make & class of hoist offered :
- 2.0 Hoist capacity, quantity & location (furnished in a schedule) :
- 3.0 Hoist lift (m) (furnish in a schedule) :
- 4.0 Type of carriage trolley :
- 5.0 Applicable standard :
- 6.0 Gears
- 6.1 Type :
- 6.2 Material :
- 7.0 Brake
- 7.1 Number per hoist :
- 7.2 Type-Make :
- 7.3 Detailed description/rating :
- 7.4 Holding torque (Kg-m) (furnish in the schedule) :
- 7.5 Method of autoactuation :
- 8.0 Hook
- 8.1 Type :
- 8.2 Material :
- 8.3 Does it conform to IS-3832 : Yes/No



MANUAL HOIST

- 9.0 Load chain :
- 9.1 Factor of safety used :
- 9.2 Construction :
- 9.3 Breaking strength (Kg) :
- 9.4 Is it as per IS:6216 : Yes/No
- 10.0 Hand Chain
- 10.1 Pull required to lift the rated load :
- 10.2 Construction :
- 10.3 Breaking strength :
- 10.4 Is is as per IS:3832 : Yes/No
- 11.0 Wheels
- 11.1 Material :
- 12.0 Weight of complete hoist (Kg) :
(Furnish in schedule)
- 13.0 Bearing :
- 13.1 Type :
- 13.2 Life :
- 13.3 Lubrication :
- 14.0 Whether all parts will be tested as per relevant IS & certificates given :
- 15.0 Catalogue enclosed : Yes/No



ELECTRIC HOIST

- 1.0 Type, make & class of hoist offered :
- 2.0 Hoist capacity (furnish in a schedule) :
- 3.0 Hoist lift (m) (furnish in a schedule) :
- 4.0 Location (furnish in a schedule) :
- 5.0 Quantity (furnish in a schedule) :
- 6.0 Travel speed (m/sec.) (furnish in a schedule) :
- 7.0 Hoisting speed (m/sec.) (furnish in a schedule) :
- 8.0 Gears
- 8.1 Type :
- 8.2 Material :
- 9.0 Brake
- 9.1 Type & make :
- 9.2 No. of brake provided per hoist :
- 9.3 Detailed description/rating :
- 9.4 Holding torque (Kg-m) (Mention in the schedule) :
- 9.5 Method of construction :



ELECTRIC HOIST**10.0 Bearing**

10.1 Type :

10.2 Lubrication :

10.3 Life :

11.0 Hook

11.1 Type :

11.2 Material :

11.3 Does it conform to IS-2758 : Yes/No

12.0 Wire Rope

12.1 Factor of safety used :

12.2 Construction :

12.3 Rope diameter (mm) :

12.4 Breaking strength (Kg/Sq.M) :

12.5 Is it as per IS-3938 & IS-2365 :

13.0 Hoist Drum

13.1 Material :

13.2 Is it as per IS-3938 :

14.0 Hoisting/Travel Motor

14.1 Make :

14.2 Rating :

14.3 Does conform to specification : Yes/No



ELECTRIC HOIST

- 14.4 Operating voltage & frequency :
with variations
- 15.0 Limit switches for hoisting/
travel motion
- 15.1 Make :
- 15.2 Type :
- 15.3 Numbers provided :
- 16.0 Flexible trailing cable
for travel
- 16.1 Make :
- 16.2 Size :
- 16.3 Travel (m) :
(Mention hoistwise)
- 17.0 Whether all parts will be : Yes/No
tested as per relevant IS
and certificates provided
- 18.0 Method of hoist operation :
- 19.0 Whether control station : Yes/No
provided as per specn.
- 20.0 Rail & end stop provided : Yes/No
- 21.0 Catalogue enclosed : Yes/No



SERVICE WATER & DRINKING WATER**SERVICE WATER**

- 1.0 Location of Pump House :
- 2.0 Size of Pump House :
- 3.0 Location & Volume of Ground Level RCC storage tank :
- 4.0 Capacity of Storage Tank in Hours :
- 5.0 No. of Service Water Pump :
- 6.0 Are those pumps suitable for 2 x 100% duty :
- 7.0 Capacity & head of Pumps :
- 8.0 Pump Details furnished in DE/DS Technical Particular Schedule :
- 9.0 Does service water pump takes care of both service water taps & DE/DS/V requirement : Yes/No
- 10.0 No. of service water taps (Building & Floor-wise) :
- 11.0 Hose & Hose connectors included in your scope of work : Yes/No
- 12.0 Have the system been designed to meet NIT Stipulations : Yes/No
- 13.0 Furnish following detail Specification -
- i) Pipes :
- ii) Valves :
- iii) Supports :
- iv) Strainers etc. :
- v) Pressure Gauge :



SERVICE WATER & DRINKING WATER

14.0 Suitable recirculation arrangement provided to run the pump at low demand as described in NIT : Yes/No

15.0 Quantity & Supply of Water required from Purchaser -

a) Quantity per hour :

b) Quantity per day :

16.0 Does the write-up describing the system enclosed : Yes/No

DRINKING WATER

1.0 Location of Pump House :

2.0 Name of the Buildings covered under three sections :

3.0 Location of tanks for each section, if any. :

4.0 Capacity of tanks for each section, if any. :

5.0 No. of Drinking Water Pump, if any :

6.0 No. of Drinking Water Taps (specify building wise) :

7.0 Have the system been designed to meet NIT Specification : Yes/No



SERVICE WATER & DRINKING WATER

8.0 Furnish following detail Specification -

- i) Pipes :
- ii) Valves :
- iii) Supports :
- iv) Strainers :
- v) Pressure Gauges :

9.0 Quantity & Supply of Water
required from Purchaser -

- a) Quantity per hour :
- b) Quantity per day :

10.0 Does the write-up describing
the system enclosed : Yes/No



COAL SAMPLING UNIT

1.0.0 Location & qty. of units	:
2.0.0 Manufacturer	:
3.0.0 Type	:
4.0.0 No. of sampling stage	:
5.0.0 Final sample sieve analysis	:
6.0.0 Sample collection rate (Kg./Hour)	:
a. Maximum	:
b. Minimum	:
7.0.0 Weight of one sample (Kg)	:
8.0.0 Min. hardness of wear and impact surfaces (BHN)	:
9.0.0 Primary sampler	:
9.1.0 Type	:
9.2.0 Qty. & capacity (TPH)	:
9.3.0 Scoop/Sweep per hr.	:
9.4.0 Kg. per Scoop/Sweep	:
9.5.0 Material of construction	:
a. Cutter/Scoop	:
b. Cutter/Scoop tip	:
9.6.0 Whether Sweep/Scoop cycle time of operation adjustable	: Yes/No
9.7.0 Indicate details of the control	:



COAL SAMPLING UNIT

9.8.0 Equipment weight (Kg.)	:
9.9.0 Type of bearing, lift, and lubrication	:
10.0.0 Belt/Screw Conveyor	:
10.1.0 Location & quantity	:
10.2.0 Capacity	:
10.3.0 Material of construction	:
10.3.1 Screw Conveyor	
a. Through	:
b. Cover	:
c. Screw	:
d. Shaft	:
10.3.2 Belt Conveyor	
a. Belt Width	:
b. Troughing angle	:
c. Enclosure	:
d. Pulley dia	:
e. Idler details	:
10.4.0 Type of mounting	:
10.5.0 Whether the reject screw/belt conveyor is reversible	: Yes/No
10.6.0 Power consumption	:
10.7.0 Equipment weight (Kg.)	:
10.8.0 Type of bearing, life & lubrication	:
11.0.0 Roll Crusher	:
11.1.0 Quantity	:
11.2.0 Capacity (TPH)	:



COAL SAMPLING UNIT

- 11.3.0 Particle size handled :
- 11.4.0 Material of construction
- a. Casing :
- b. Rollers :
- c. Hopper & its liner with thickness :
- 11.5.0 Whether the rolls are adjustable :
- 11.6.0 Equipment weight (Kg.) :
- 11.7.0 Type of bearing, life and lubrication :
- 12.0.0 Secondary Sampler
- 12.1.0 Quantity & type :
- 12.2.0 Rated sample collection rate (Kg/hour) :
- 12.3.0 Cutter teeth material :
- 12.4.0 Whether cutter opening adjustable : Yes/No
- 12.5.0 Equipment weight (Kg) :
- 12.6.0 Type of bearing, lift and lubrication :
- 13.0.0 Sample bin
- 13.1.0 Quantity :
- 13.2.0 Size :



COAL SAMPLING UNIT

13.3.0 Material of construction x plate thickness:

14.0.0 Local Panel

14.1.0 Local panel provided : Yes/No

14.2.0 Details of local panel :

15.0.0 Whether motors are as per Spec. :

16.0.0 Total electrical load (KW) :

17.0.0 Break-up of electrical loads (KW) :

18.0.0 Whether suitable for 24 hours
of operation of plant/day : Yes/No

19.0.0 Whether sampling unit offered
is suitable for given conveyor data :

20.0.0 Interconnecting Chutes

20.1.0 Material :

20.2.0 Thickness :

20.3.0 Minm. valley angle (degree) :

21.0.0 All supporting structure
included in scope : Yes/No

22.0.0 Leaflet/catalogue enclosed : Yes/No

23.0.0 Write-up on total operation
of the coal sampling unit : Yes/No



SERVICE AIR

1.0 2 x 100% compressors for compressed air system to cater DE, service air provided? :

2.0 2 x 100% compressors for compressed air system for bottom door opening of wagons provided? :

3.0 Capacity and discharge pressure of compressors :

4.0 Instrument quality pressurized air system considered as per requirement? :

5.0 Whether the service air line is distributed throughout the CHP area including conveyor tunnel/galleries with tapping points at ever 50M interval and in every operating floor/platforms in TP's/buildings :

6.0 Hose & Hose connections included :

7.0 Have the system been designed as per specification :

8.0 Furnish following detail specification

i) Pipes :

ii) Valves :

iii) Supports :

iv) Strainers etc. :

v) Pressure gauge :



PAINTING OF MECHANICAL ITEMS
(Fill up for each item/equipment)

Sl. No.	Item/ Equipment	Pretreatment	Primer Coat (1st & 2nd) DFT Type Colour Code	Finish Coat (1st, 2nd & 3rd) DFT Type Colour Code
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DUST EXTRACTION, DUST SUPPRESSION & VENTILATION SYSTEM

Bidder must submit separate detailed schedules for DE, DS, Ventilation System in addition to the filled-in Technical Particulars asked for as below:

1.00.00 CENTRIFUGAL FAN (For Each Fan)**SL.NO. DATA/EQUIPMENT NO.**

1.01.00 Manufacturer & Model No.	:
1.02.00 Type	:
1.03.00 Number quoted	:
1.04.00 Capacity Cu.M/hr.	:
1.05.00 Specific weight of air at temperature considered (Kg/Cu.M)	:
1.06.00 Rated speed in R.P.M.	:
1.07.00 Total head at above speed in mm W.G.	:
1.08.00 Static head at rated speed in mm W.G.	:
1.09.00 Critical speed of fan rotating assembly in RPM	:
1.10.00 Fan power at rated speed	:
1.11.00 Fan total efficiency at rated speed percent	:
1.12.00 Wheel diameter in mm	:
1.13.00 Overall wheel width in mm	:
1.14.00 Outlet velocity in m/sec.	:
1.15.00 Material used in wheel & its thickness, mm	:
1.16.00 Material used in shaft	:
1.17.00 Type of bearing & its number	:



DUST EXTRACTION, DUST SUPPRESSION & VENTILATION SYSTEM**SL.NO. DATA/EQUIPMENT NO.**

1.18.00 Type of fan drive	:
1.19.00 Drive manufacturer	:
1.20.00 Number of belts	:
1.21.00 Size of belts	:
1.22.00 Vibration isolator manufacturer	:
1.23.00 Vibration isolator size & no.	:
1.24.00 Outlet damper size	:
1.25.00 Outlet damper type	:
1.26.00 Material & thickness of louvre and casing	:
1.27.00 Inlet damper type	:
1.28.00 Inlet damper size	:
1.29.00 Material and thickness of plate used in the casing and flap on the damper	:
1.30.00 Rated volt of motor	:
1.31.00 Rated KW of motor offered	:
1.32.00 Type of insulation	:
1.33.00 Motor ambient temperature deg.C	:
1.34.00 Type of enclosure	:
1.35.00 Motor RPM	:
1.36.00 Motor frame size	:



DUST EXTRACTION, DUST SUPPRESSION & VENTILATION SYSTEM**SL.NO. DATA/EQUIPMENT NO.****2.00.00 AXIAL FLOW FANS (For each Fan)**

2.01.00 Manufacturer and Model No.	:
2.02.00 Type	:
2.03.00 Number quoted	:
2.04.00 Specific weight of air at temperature considered (Kg/Cu.M)	:
2.05.00 Capacity in Cu.m/hr.	:
2.06.00 Static head at rated speed in mm WG	:
2.07.00 Total head at rated speed in mm WG	:
2.08.00 Rated speed in R.P.M.	:
2.09.00 Critical speed of fan rotating assembly in RPM	:
2.10.00 Fan power at rated speed	:
2.11.00 Fan efficiency at rated speed	:
2.12.00 Wheel diameter	:
2.13.00 No. of blades in wheel	:
2.14.00 Outlet velocity in m/sec.	:
2.15.00 Material used in fan wheel	:
2.16.00 Material in other parts	:
2.17.00 Type of fan bearing & its no.	:
2.18.00 Type of drive	:



DUST EXTRACTION, DUST SUPPRESSION & VENTILATION SYSTEM**SL.NO. DATA/EQUIPMENT NO.**

2.19.00 Rated volt of motor :

2.20.00 KW of motor offered :

2.21.00 Type of insulation :

2.22.00 Motor ambient temp. deg.C :

2.23.00 Type of enclosure :

2.24.00 Motor RPM :

2.25.00 Motor frame size :

3.00.00 METALLIC FILTER (for each fan)

3.01.00 Manufacturer :

3.02.00 Filter frame materials :

3.03.00 Filter mesh material :

3.04.00 Filter wire mesh :

3.05.00 No. of layers :

3.06.00 Filter size :

4.00.00 CENTRIFUGAL PUMP

4.01.00 Manufacturer :

4.02.00 Model No. :

4.03.00 Total no. required :

4.04.00 Type :

4.05.00 Performance

4.05.01 Rated capacity, litres/min. :

4.05.02 Total head at rated capacity in MWG :



DUST EXTRACTION, DUST SUPPRESSION & VENTILATION SYSTEM**SL.NO. DATA/EQUIPMENT NO.**

4.05.03 Permissible suction lift in MWG :

4.06.00 Construction

4.06.01 No. of Stages :

4.06.02 Pump Bearing

- a. Ball :
- b. Roller :
- c. Journal :

4.06.03 Connection sizes

- a. Inlet :
- b. Outlet :

4.06.04 Material of construction

- a. Casing :
- b. Impeller wearing ring :
- c. Impeller :
- d. Casing wearing ring :
- e. Shaft :
- f. Shaft sleeve :
- g. Stuffing box :
- h. Stuffing box housing :
- i. Sealing :

4.07.00 Accessories Supplied

4.07.01 Pump motor base frame :

4.07.02 Coupling :

4.07.03 Coupling guard :

4.07.04 Pressure gauges :

- a. Suction :
- b. Delivery :



DUST EXTRACTION, DUST SUPPRESSION & VENTILATION SYSTEM**SL.NO. DATA/EQUIPMENT NO.****5.00.00 UNITARY AIR FILTRATION UNIT**

5.01.00 Manufacturer	:
5.02.00 Type & Model No.	:
5.03.00 No. Quoted	:
5.04.00 Air quantity	:
5.05.00 Pressure Drop	:
5.06.00 Total wt. of the unit	:
5.07.00 Filter Sets	
5.07.01 Manufacturer	:
5.07.02 Filter frame material	:
5.07.03 Filter cloth material	:
5.07.04 Filter cloth mesh	:
5.07.05 No. of layers	:
5.07.06 Filter size	:
5.08.00 Moisture Eliminator	
5.08.01 Manufacturer	:
5.08.02 Type of cloth	:
5.08.03 Frame material	:
5.08.04 Cloth material	:
5.08.05 Cloth mesh	:
5.08.06 No. of layers	:



DUST EXTRACTION, DUST SUPPRESSION & VENTILATION SYSTEM**SL.NO. DATA/EQUIPMENT NO.**

5.08.07 Size	:
5.09.00 Nozzles	
5.09.01 Manufacturer	:
5.09.02 Type and model no.	:
5.09.03 No. quoted	:
5.09.04 Performance	:
a. Capacity in litres/min.	:
b. Pressure drop in mm of WG	:
5.09.05 Nozzle size	:
5.09.06 Nozzle material	:
5.10.00 Casing	
5.10.01 Construction	:
a. Size	:
b. Material	:
c. Thickness, mm	:
5.10.02 Whether allotted space is adequate	:
5.11.00 Pump	
5.11.01 Manufacturer	:
5.11.02 Model No.	:
5.11.03 Quantity	:



DUST EXTRACTION, DUST SUPPRESSION & VENTILATION SYSTEM**SL.NO. DATA/EQUIPMENT NO.**

5.11.04 Type	:
5.11.05 Rated capacity, Litre/Min.	:
5.11.06 Total head at rated capacity (MWG)	:
5.11.07 Pump input (KW)	:
5.11.08 Drive motor (KW)	:
5.11.09 Drive motor frame size	:
5.11.10 Pump speed	:

6.00.00 DUST EXTRACTION UNIT (Dry Type)

6.01.00 Manufacturer	
6.02.00 Total no. quoted	:
6.03.00 Model No.	:
6.04.00 Type	:
6.05.00 Performance	
6.05.01 Capacity in Cu.m/hr.	:
6.05.02 Pressure drop	:
6.05.03 Efficiency of collection of dust	:
6.05.04 Transport velocity in ducts	:
6.05.05 Extraction air quantity at various points of collection	:
6.06.00 Cyclone	:
6.06.01 Overall dimensions	:
6.06.02 Material of casing	:



DUST EXTRACTION, DUST SUPPRESSION & VENTILATION SYSTEM**SL.NO. DATA/EQUIPMENT NO.**

6.06.03 Thickness of casing, mm	:
6.06.04 Gross weight in Kg.	:
6.06.05 Pressure drop	:
6.07.00 Bag Filter	
6.07.01 Inlet Air	
a. Source/type	: Dust laden
b. Qnty. (at actual conditions)	: Cu.m/hr.
6.07.02 Design Parameters	
a. Make/type	:
b. Design (in rows, circular etc.)	:
c. Number of	:
- compartments	:
- elements per compartment:	
d. Filtering area	:
- total area	: sq.m
- effective area	: sq.m
e. Air cloth to ratio (effective area)	: Cu.m/Cu.m
f. Pressure drop inlet/outlet	: mm W.G.



DUST EXTRACTION, DUST SUPPRESSION & VENTILATION SYSTEM

SL.NO. DATA/EQUIPMENT NO.

6.07.03 Construction Parameters

Housing -

a. Material : mm

b. Wall thickness : mm

c. Overall dimensions :

d. Hopper -

- material :

- wall thickness :

e. Location

- No. and size of access doors : mm

- Valley angle with the horizontal : degree

Filter Element

a. Design/type :

b. Fabric material standard

- weight : gm/sq.m

Rapping/Cleaning Mechanism

a. Type :

b. Actuator for pulse generation : Diaphragm/Piston

c. Venturi provided : Yes/No

d. No. of venturi :



DUST EXTRACTION, DUST SUPPRESSION & VENTILATION SYSTEM

SL.NO. DATA/EQUIPMENT NO.

e. Material of venturi :

f. Control of scavenging airmech/pneu./
solenoid valve :

g. Heating of scavenging air

- power required : Yes/No

h. Air pressure required :

6.07.04 Air Drier

a. Make/design :

b. Rated capacity : Cu.Nm/h

c. Static pressure drop : mm W.G.

6.07.05 Oil Separator

a. Make/design :

b. Rated capacity :

c. Static per drop :

6.07.06 Accessories

a. Weather protection provided : Yes/No

b. Timer for compressed air control : Yes/No

c. Temperature control device : Yes/No

Rotary Feeder

Capacity :

Speed :

Drive :



DUST EXTRACTION, DUST SUPPRESSION & VENTILATION SYSTEM**SL.NO. DATA/EQUIPMENT NO.**

Accessories provided

Valves :

Rotary feeder :

Screw conveyor :

6.08.00 Hopper :

6.08.01 Thickness of plate in mm :

6.08.02 Capacity :

6.08.03 Overall dimensions :

6.09.00 Rotary Feeder :

6.09.01 Capacity :

6.09.02 Speed :

6.09.03 Drive :

6.09.04 Interlocking :

6.10.00 Accessories Provided

6.10.01 Butterfly valve :

6.10.02 Manometer :

**7.00.00 DUST SUPPRESSION SYSTEM/
DRY FOG SYSTEM**

7.01.00 Nozzles

7.01.01 Manufacturer :

7.01.02 Type and Model No. :

7.01.03 No. Quoted :



DUST EXTRACTION, DUST SUPPRESSION & VENTILATION SYSTEM**SL.NO. DATA/EQUIPMENT NO.**

7.01.04 Performance :

7.01.05 Capacity in Litres/Min. :

7.01.06 Nozzle Size :

7.01.07 Pressure Drop in mm of WG :

7.01.08 Nozzle Material :

7.02.00 Piping

7.02.01 Material :

7.02.02 Size and length (indicate
separately for each size) :7.02.03 Whether suitable anticorrosive
treatment for buried piping has been
considered as per specification :7.02.04 Whether earth digging and sub-
sequent filling has been considered for
laying underground pipes :

7.03.00 Valves

7.03.01 Type

7.03.02 Material :

7.03.03 Total no. of quoted :

7.03.04 Specification :

8.00.00 DUCTING8.01.00 Minimum transport velocity
(DE/Vent. System) :

8.02.00 Ducting fabricated at site :



DUST EXTRACTION, DUST SUPPRESSION & VENTILATION SYSTEM**SL.NO. DATA/EQUIPMENT NO.**

- 8.03.00 Ducting material (mention applicable code also) :
- 8.04.00 Minimum thickness in straight run :
- 8.05.00 Additional thickness provided for :
- 8.06.00 Duct supports provided :
- 8.07.00 Spacing centre to centre :
- 8.08.00 Clean out opening provided :
- 8.09.00 Flexible connection between duct work fan provided :
- 8.10.00 Material of flexible connection :

9.00.00 ELECTRIC MOTORS

Please furnish completely filled up motor data sheets in line with enclosed electrical Specification.

10.00.00 GUARANTEED CONSUMPTION FIGURES FOR POWER & WATER

- 10.01.00 Total Power Consumption (KW) :
- 10.02.00 Total Water Requirement (Cu.M/H) :



AIR COMPRESSOR
(For each type of Compressor)

1.0.0 Air Compressors as specified provided? : Yes/No

2.0.0 Nos. provided (including 100% by-pass) :

3.0.0 Capacity of each compressor :

4.0.0 Items being Cu.mm/min. catered
for by compressor :

5.0.0 Design Ambient Inlet Temp.,
Pressure & relative humidity
(Deg.C/Kg./cm.Sq.g/%) :

6.0.0 Discharge Pressure
(kg./cm.sq.g) & No. of Stages :

6.1.0 Input Power at specified
design capacity (KW) :

7.0.0 Lubricated type or non-
lubricated type? :

8.0.0 Intercooler/Aftercooler provided? :

9.0.0 Air Drive Provided? :

10.0.0 Intake filter, Air receiver provided? :

11.0.0 Capacity of Air receiver :

12.0.0 Any other items including
piping, valves etc. as required
for troublefree operation provided? : Yes/No

13.0.0 Instrumentation like pressure
gauge, temperature gauge,
pressure switch, etc. as
required included in scope? :



ELEVATOR

1.0 Type	:
2.0 Make	:
3.0 Elevator capacity	:
4.0 Cage platform dimensions	:
5.0 Travel speed	:
6.0 Pinion	:
6.1 Pinion	:
6.2 Material	:
7.0 Rack	:
7.1 Each rack length & gravity	:
7.2 Material	:
7.3 Fixing arrangement	:
8.0 Maximum mast height	:
8.1 Mast holding arrangement	:
8.2 Travel length considered	:
9.0 Min. floor opening for pressure of cage	:
10.0 Motor power consumption	:
11.0 Brake	:
11.1 Type & Make	:
11.2 No. of brake provided	:



ELEVATOR

11.3 Holding torque (Kg.M)	:
11.4 Brake description/rating	:
12.0 Travel Motor	:
12.1 Make	:
12.2 Rating	:
13.0 Telephone facility provided or not	: Yes/No
14.0 Fan provided within cage	: Yes/No
15.0 Lighting fixture provided within Cage	: Yes/No
16.0 Supporting structure included In scope	: Yes/No
17.0 G.A. drawing enclosed	: Yes/No
18.0 Catalogue of Elevation enclosed	: Yes/No



AUXILIARY POWER CONSUMPTION, 1x660 SAGARDIGHI TPS

Guaranteed Power Consumption to be filled in by bidder

AUXILIARY POWER CONSUMPTION FOR CONVEYOR PACKAGE

Sl.No.	Eqpt/BCN	Actual KW	motor rating factor	power consumption	Duty Factor	FLOW Path	Final KW FLOW Path from WT to the last bunker feeding conveyor
		I	II	III=I X II	IV	V	VI=III X IV X V
A	COAL HANDLING SYSTEM						
1	BCN-29A				1	1	
2	BCN-29B				1	1	
	BCN-30A				1	1	
	BCN-30B				1	1	
	BCN-31A				1	1	
	BCN-31B				1	1	
	BCN-32A				1	1	
	BCN-32B				1	1	
	BCN-33A				1	1	
	BCN-33B				1	1	
	BCN-34A				1	1	
	BCN-34B				1	1	
	BCN-35A				1	1	
	BCN-35B				1	1	
	BCN-36A				1	1	
	BCN-36B				1	1	
	BCN-23A				1	0	
	BCN-23B				1	0	
	BCN-24A				1	0	
	BCN-24B				1	0	
	BCN-25A				1	1	
	BCN-25B				1	1	
	Crusher-1				1	1	
	Crusher-2				1	1	
	Crusher-3				1	0	
	Screen-1				1	1	
	Screen-2				1	1	
	Screen-3				1	0	
	Belt Feeder-1				1	1	
	Belt Feeder-2				1	1	
	Belt Feeder-3				1	0	
	TTR-1				1	1	
	TTR-2				1	1	
	Metal detector (4 nos)				1	1	
	Suspended Magnet (2 nos)				1	1	
	ILMS (4 nos)				1	1	
	Belt weigher (4 nos)				1	1	

GUARANTEED TOTAL POWER CONSUMPTION (KW)

0.0

Note-1: Bidder to note that the guaranteed power consumption for Coal handling system Conveyor package shall not exceed 6289 kW. BHEL will load the offered price as per BHEL GCC.

Note-2: As per Tender Mendment V.IIA/Amend-3/Sch. Of guarantees: Flow Path From Wagon tippler to the boiler bunker of UNIT#5 through both conveyor no. BCN-29A and BCN-29B (Longest Path) running simultaneously (Duty factor for CHP shall be 1.0)



**ANNEXURE#8
of
TECHNICAL ENQUIRY SPECIFICATION
for
Coal Handling Plant Conveyor System**

**for

SAGARDIGHI THERMAL POWER PROJECT
1 x 660 MW UNIT NO. 5, PHASE – III
WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED**

Content:

Mandatory Spares List -(mechanical & electrical)

Mandatory Spares for CHP Conveyor Package (Mechanical)

Sl. No.	Equipment/Package Name	Quantity to be supplied by the bidder
1.00.00	COAL HANDLING PLANT	
1.01.00	IDLERS	
1.01.01	Troughing Idlers 35° (20° for RBF) complete set with base boards & mounting brackets etc.	
i)	For 1600 mm. Width Belt	20 nos.
ii)	For 1400 mm Width Belt	60 nos.
iii)	For Reversible Belt Feeder	8 nos.
1.01.02	Flat return idlers complete set with mounting base boards & mounting bracket etc.	
i)	For 1600 mm. Width Belt	9 nos.
ii)	For 1400 mm Width Belt	27nos.
iii)	For Reversible Belt Feeder	5 nos.
1.01.03	Impact Idlers 35°/20° Degree complete set with mounting base boards and brackets etc.	
i)	For 1600 mm. Width Belt	10 nos.
ii)	For 1400 mm Width Belt	30 nos.
iii)	For Reversible Belt Feeder	16 nos.
1.01.04	Training idlers 35° /20° (troughing) complete set with mounting base boards and brackets etc. (True- Trac type)	
i)	For 1600 mm. Width Belt	3 nos.
ii)	For 1400 mm Width Belt	7 nos.
iii)	For Reversible Belt Feeder	4 nos.
1.01.05	Flat return trainer idlers complete set with mounting base boards & mounting bracket etc. (True-Trac type)	
i)	1600 mm. Width Belt	8 nos.
ii)	For Reversible Belt Feeder	4 nos.
1.01.06	Transition idlers complete set with base boards & mounting brackets etc.	
i)	For 1600 mm. Width Belt	8 nos.
ii)	For Reversible Belt Feeder	3 nos.
1.01.07	Rubber discs for impact idlers	10% of the Rubber disc as fitted on the Impact Idlers used in the entire system
1.01.08	Rollers for the above mentioned each type of idlers (Excluding Tracker type)	20% of the Installed Quantity
1.02.00	REVERSIBLE BELT FEEDER DRIVE AND BELT	
1.02.01	Conveyor Drive Gear Box	
(i)	Complete Gear box assembly with hold back device.	1 (One) set of each type & rating for right hand & left hand
(ii)	Input Shaft with pinion	1 (one) set of each type & rating
(iii)	Output shaft with pinion	1 (one) set of each type & rating
(iv)	Oil Seal	2 (two) sets of each type & rating
(v)	Bearings	2 (two) sets of each type & rating
(vi)	Cooling fan with cover	2 (two) sets of each type & rating
(vii)	Hold Back device	1 (one) set of each type & rating
1.02.02	Geared Coupling	
(i)	Coupling (Flexible)	1 no. of each type
(ii)	Coupling bolts(Pins with bushes)	1 set of each type.
(iii)	Seal kit for gear coupling (O-ring)	1 set of each type.
1.02.03	Fluid Coupling	
(i)	Complete set of Fluid Coupling	1 set for each type and size
(ii)	Multi Disc Assembly	1 no.for each type and size
(iii)	Resilient Driving Plate	1 no.for each type and size
1.02.04	Belt	3(three) times of full length belt used in 1(one) RBF
1.02.05	Drive Motor (For RBF)	1no. for each type and size
1.02.06	Motor terminal block with studs for motors	1 set for each rating and type of motor
1.03.00	CONVEYOR DRIVE AND CONVEYOR BELT	
1.03.01	Belt	

Mandatory Spares for CHP Conveyor Package (Mechanical)

Sl. No.	Equipment/Package Name	Quantity to be supplied by the bidder
(i)	Main Conveyors	120% of longest belt or 10% of population of each type & rating, whichever is more
(ii)	bunker seal belt	120% of population of Full length of each
1.03.02	Belt Sway Switch complete assembly with electronic units	10% of each type
1.03.03	Belt Sway Switch complete assembly with electronic units	10% of each type
1.03.04	Pull cord switch complete assembly with electronic units	15% of each type
1.03.05	Zero speed switch complete assembly with electronic units	15% of each type
1.03.06	Sensor/ probe of Zero speed switches	15% of each type(min.1 No) of each type and speed range
1.03.07	Chute Block switch complete assembly with electronic units	15% of each type
1.03.08	Sensor/ probe of Chute Block switch	15% of each type
1.03.09	Under belt switches	10% of each type
1.03.10	Position switches for trippers,	10% of each type
1.04.00	PULLEY	
1.04.01	Pulleys Complete with Shaft and lagging (excluding bearing & Plummer Block)	1 no. for each size and shaft diameter of Pulley
1.04.02	Plummer block complete with bearings & Sleeves	2 nos. for each type and size.
1.04.03	SS Pulleys Complete with Shaft and lagging (excluding bearing & Plummer Block)	1 no. for each size of Pulley & Shaft Diameter.
1.04.04	SS Plummers block complete with bearings & Sleeves	2 nos. for each type and size.
1.05.00	RUBBER/NYLON STRIP FOR SKIRT BOARD	25% of total quantity used
1.06.00	COMPLETE BELT SCRAPER (PRIMARY & SECONDARY & INTERNAL)	20% of total population of each type and size
1.07.00	MAGNETIC SEPARATOR	
1.07.01	Cleanout Conveyor	3 sets
1.07.02	SS Cleat	SS Cleat
1.07.03	SS Bolt for Cleat	100 nos.
1.07.04	Complete unit of Geared Motor including Motor	1 set
1.07.05	Pulleys with plummer blocks and bearings	1 sets of each size & type
1.07.06	Sheaves	1 no. of each size & type
1.07.07	Cooling Oil Pump	1 no.
1.07.08	Cooling Oil flow control Valve	1 no.
1.07.09	Electrical Items	
i.	Rectifier transformer	1no.
ii.	Insulating Stud of the Magnet	1set (2nos.)
iii.	Rectifier with surge arrester	1set.
iv.	Semi-conductor Fuse for Power Diode	6 nos.
v.	Power Contactor	2 nos. of each type and rating
vi.	Auxiliary Contactor	2 nos. of each type and rating
vii.	Control transformers	1 no. of each type
viii.	MCB	1 no. of each type and rating
ix.	Ammeter	2 no. of each type and range
x.	Under current relay	1 no. of each type
xii.	Motor terminal block with studs for all motors	1 set for each rating and type of motor
1.08.00	RING GRANULATOR	
1.08.01	Plummer block assemblies (complete with bearing and seal etc.)	2 sets
1.08.02	Shaft seal	2 sets
1.08.03	Hammer	6 sets (one set means complete replacement of hammers for one crusher)
1.08.04	Screw Jack Assembly for the Door Sealing (if applicable)	1 set

Mandatory Spares for CHP Conveyor Package (Mechanical)

Sl. No.	Equipment/Package Name	Quantity to be supplied by the bidder
1.08.05	Rotor assembly consisting of Rotor, shaft, End discs, distance rings, middle discs, suspension bars, disc clamping nuts and shafts extension etc. but without hammer rings, bearings and bearing blocks.	1set
1.08.06	Cage bars (if applicable)	2sets
1.08.07	Breaker plate with HT Bolts	2sets
1.08.08	Liner Plates	2sets (one set means complete replacement of one crusher)
1.08.09	Suspension bars with Brass Plug	8sets
1.08.10	Kick off plate with HT Bolts	8nos.
1.08.11	Screen Plate with HT Bolts (upper)	2nos.
1.08.12	Screen Plate with HT Bolts (lower)	2nos.
1.08.13	Fluid Coupling	
i.	Complete set of Fluid Coupling	1no.
ii.	Bearing	1no. for each type and size
iii.	Sealing ring	1no. for each type and size
iv.	Multi Disc Assembly	1no.
v	Resilient Driving Plate	1no.
vi.	Fusible Plug	6nos.
1.08.14	Drive Motor for crusher	1 no.
1.08.15	Component spares for Drive Motor	Item & Quantity same as indicated in Sl No. 7 of Mandatory spare list (electrical & C&I)
1.08.16	Zero Speed Switch	1no.
1.09.00	ROLLER SCREEN	
1.09.01	Drive assembly complete without motor and motor seal	1set
1.09.02	Bearing	8nos. for each type and size
1.09.03	Seal	2nos. for each type and size
1.09.04	Liners with Bolts	1set
1.09.05	Roll Body Shaft	2set (set means one complete set for one Screen)
1.09.06	Roll Body	2set (set means one complete set for one Screen)
1.09.07	Drive Motor	1no
1.09.08	Component spares for Drive Motor	Item & Quantity same as indicated in Sl No. 7 of Mandatory spare list (electrical & C&I)
1.10.00	pneumatic flap gate	
1.10.01	Flap gate shaft	1nos. of each type & rating
1.10.02	Actuator	1no. for each type/Stroke Length and Torque rating
1.10.03	Position Limit/Torque Switch	5 nos. of each type and rating
1.10.04	Seal Kit for Actuator	1set for each type/Stroke Length and Torque rating
1.10.05	Complete Solenoid Valve with coil	10nos.
1.10.06	Coils for Solenoid Valve	10nos.
1.10.07	Air Filter Regulator	5nos.
1.11.00	RACK & PINION GATE	
1.11.01	Limit switch	6nos.
1.11.02	Rollers with bearings	20nos.
1.11.03	Gear box assembly	1 set of each type
1.11.04	Chains & Sprockets	2nos.
1.11.05	Local Control Station	1no.
1.11.06	Drive Motor	1no. for each rating
1.11.07	Component spares for Drive Motor	Item & Quantity same as indicated in Sl No. 7 of Mandatory spare list (electrical & C&I)
1.12.00	SUMP PUMP	
1.12.01	Complete pump assembly with pump, motor coupling, base etc	1 set each type and rating
1.12.02	Impeller with key & nut	2 set of each size & type
1.12.03	Oil seal	4 nos. of each size
1.12.04	Coupling bolt with bushes	2 sets of each type
1.12.05	Pump shaft	2 nos. of each size

Mandatory Spares for CHP Conveyor Package (Mechanical)

Sl. No.	Equipment/Package Name	Quantity to be supplied by the bidder
1.12.06	Shaft sleeve	4 sets of each size
1.12.07	Bearing bush	4 sets of each size
1.12.08	Set of bearings	2 sets
1.12.09	Set of gland packing	2 sets of each type
1.12.10	Level Switch	1 nos. of each type
1.13.00	Compressed Air System	
1.13.01	Dry Air Intake Filter	5 Nos.
1.13.02	Complete set of Loading- unloading valve assembly	2 Sets (one set means complete replacement for one compressor)
1.13.03	Low Pressure Compressor element (Screw) with Drive end & Non-drive end Bearings for Male & Female Elements	2 Sets (one set means complete replacement for one compressor)
1.13.04	High Pressure Compressor element (Screw) with Drive end & Non-drive end Bearings for Male & Female Elements	2 Sets (one set means complete replacement for one compressor)
1.13.05	Plug for Inter cooler Tube Bunch	15 Nos
1.13.06	Plug for After Cooler Tube Bunch	15 Nos
1.13.07	Automatic Purge Drain Valve for Inter cooler and After cooler	2 Sets (one set means complete replacement for one compressor)
1.13.08	Air Outlet Check Valve	2 Nos.
1.13.09	Air Outlet Compensator	1 Set (one set means complete replacement for one compressor)
1.13.10	Lub oil filter	5 Nos.
1.13.11	Lub oil Pressure Regulating valve	1 No.
1.13.12	Different oil seals/O-ring for Lub oil system	4 Sets (one set means complete replacement for one compressor)
1.13.13	Cooling water Inlet and Outlet connection bellows	2 Sets (one set means complete replacement for one compressor)
1.13.14	Gear Box Unit Complete	1 Set (one set means complete replacement for one compressor)
1.13.15	Gear Box Component	
(i)	Different Oil Seals/O-ring	2 Sets (one set means complete replacement for one compressor)
(ii)	Set Of Bearings	1 Set (one set means complete replacement for one compressor)
(iii)	Breathing Unit	2 Nos
1.13.16	Component of L.P Cylinder	
(i)	Gear sets	1 Set (one set means complete replacement for one compressor)
(ii)	Set of bearings	1 Set (one set means complete replacement for one compressor)
(iii)	Mechanical Seal & O-ring	1 Set (one set means complete replacement for one compressor)
1.13.17	Component of HP Cylinder	
(i)	Gear sets	1 Set (one set means complete replacement for one compressor)
(ii)	Set of bearings	1 Set (one set means complete replacement for one compressor)
(iii)	Mechanical Seal & O-ring	1 Set (one set means complete replacement for one compressor)
(iv)	Different Safety Valves	1 Set (one set means complete replacement for one compressor)
(v)	Coupling	
(a)	Complete Set of Coupling (Motor to Compressor)	1 Set (one set means complete replacement for one compressor)
(b)	Flexible Rubber for Coupling	4 Nos.
1.13.18	Drain Moisture Trap	2 Sets (one set means complete replacement for one compressor)

Mandatory Spares for CHP Conveyor Package (Mechanical)

Sl. No.	Equipment/Package Name	Quantity to be supplied by the bidder
1.13.19	Safety Valve's Springs & Gasket for LP Stage	1 Set (one set means complete replacement for one safety valve)
1.13.20	Safety Valve's Springs & Gasket for HP Stage	1 Set (one set means complete replacement for one safety valve)
1.13.21	Oil Pump & Motor Complete Assembly	1 Set
1.13.22	Drive Motor	1 No.
1.13.23	Other Spares as applicable as per the Electrical List	Applicable Item & Quantity same as indicated in Electrical list Sl. No.7.08.00, 7.12.00 & 7.21.00
1.13.24	Compressed Air Line Valves	As applicable as per Sl. No.5.05.02
1.13.25	C&I Items	
(i)	PLC with MMI System	Applicable Item & Quantity same as indicated in C&I list Sl. No. 8.03.00
(ii)	Field Instruments & Others as applicable as per the C&I List	Applicable Item & Quantity same as indicated in C&I list Sl. No. 8.04.00, 8.07.00 & 8.10.00
1.13.26	Air Drying Plant (HOC Type)	
(i)	Pre-filter Elements	2 Sets (one set means complete replacement for one drier filter)
(ii)	After-filter Elements	2 Sets (one set means complete replacement for one drier filter)
1.14.00	DUST SUPPRESSION SYSTEM (PLAIN WATER + DRY FOG)	
1.14.01	Pump impeller with key and nut	2 sets of each type and size
1.14.02	Pump shaft	2 Nos. of each type and size
1.14.03	Bearings	2 sets of each type and size
1.14.04	Wearing rings	2 sets of each type and size
1.14.05	Shaft Sleeve	2 sets of each type and size
1.14.06	Bushings	2 sets of each type and size
1.14.07	Coupling bolts & nuts (with bushes)	2 sets
1.14.08	Spray nozzles (applicable for Plain water)	100 nos. of each type and size
1.14.09	Solenoid valves	10% of each type and size
1.14.10	Globe valve/ plug valves	10% of each type and size
1.14.11	Gate valve	2 nos. of each size
1.14.12	Strainers	2 nos. of each type
1.14.13	Spray nozzles (applicable for Dry fog)	10% of the total quantity used in the system for each type of location.
1.14.14	Sprinklers	10% of installed
1.14.15	Drive Motor for Pump	1no for each rating
1.14.16	Component spares for Drive Motor	Item & Quantity same as indicated in Sl No. 7 of Mandatory spare list (electrical & C&I)
1.14.17	Solenoid valve	10% of the total quantity used in the system for each types or minimum 2 nos. whichever is higher
1.14.18	Coils	2 nos. of each type & rating
1.15.00	SERVICE WATER	
1.15.01	Pump impeller with key and nut	2 sets of each type and size
1.15.02	Pump shaft	2 Nos. of each type and size
1.15.03	Bearings	2 sets of each type and size
1.15.04	Wearing rings	2 sets of each type and size
1.15.05	Shaft Sleeve	2 sets of each type and size
1.15.06	Bushings	2 sets of each type and size
1.15.07	Coupling bolts & nuts (with bushes)	2 sets
1.15.08	Drive Motor for Pump	1no for each rating
1.16.00	VENTILATION SYSTEM	
1.16.01	Fan bearings	1set of each size
1.16.02	Bearings for pumps	1set of each size
1.16.03	V-Belt	1set of each type.
1.16.04	Pre-filter of pressurizing fans	5 sets of each type
1.16.05	Foundation Rubber pads	2 sets of each type and size
1.16.06	Plummer blocks	2 sets of each type and size
1.16.07	Drive Motor	1no for each rating

Mandatory Spares for CHP Conveyor Package (Mechanical)

Sl. No.	Equipment/Package Name	Quantity to be supplied by the bidder
1.16.08	Component spares for Drive Motor	Item & Quantity same as indicated in SI No. 01.00.00 of Mandatory spare list (electrical & C&I)
1.16.09	Nozzles	10% of each size.
1.16.10	Other Electrical Spares as applicable as per the Electrical List	Item & Quantity same as indicated in SI No. 7 of Mandatory spare list (electrical & C&I)
1.17.00	TRAVEL TRIPPER	
1.17.01	Tripper Head Pulley with Pillow Block & Bearing	1set
1.17.02	Tripper Bend Pulley with Pillow Block & Bearing	1set
1.17.03	Complete set of Travel Gear Box	1set
1.17.04	Bearings for Gear Box	2 sets
1.17.05	Drive axle with wheels, plummer blocks, bearings etc.	1 set
1.17.06	Oil seals	4 nos. of each size
1.17.07	Non-drive axle with wheels plummer blocks, bearings etc.	1 set of each type
1.17.08	Complete Motorized Actuator for Flap Gate	1no.
1.17.09	Drive motor	1 no.
1.17.10	Component spares for Drive Motor	Item & Quantity same as indicated in SI No. 7 of Mandatory spare list (electrical & C&I)
1.17.11	Brake assembly complete	2 sets
1.17.12	Rail Clamp Actuator with motor	1no.
1.17.13	Set of limit switches	2 nos. of each type
1.17.14	Other Electrical Spares as applicable as per the Electrical List	Item & Quantity same as indicated in SI No. 01.00.00 of Mandatory spare list (electrical & C&I)
1.18.00	DUST EXTRACTION SYSTEM	
1.18.01	Fan bearing	1set of each type.
1.18.02	V-belt	1set of each size.
1.18.03	Rotary air lock valve with drive	1set
1.18.04	Filter bags	10% of the total quantity used in the system for each types of bags.
1.18.05	Drive Motor	1no for each rating
1.18.06	Complete Solenoid valve	10% of the total quantity used in the system for each types or minimum 2 nos. whichever is higher
1.18.07	Coils for Solenoid Valve	2 nos. of each type & rating
1.18.08	Local Control Station	1no. for each type
1.18.09	Other Electrical Spares as applicable as per the Electrical List	Item & Quantity same as indicated in SI No. 01.00.00 of Mandatory spare list (electrical & C&I)
1.18.10	Component spares for Drive Motor	Item & Quantity same as indicated in SI No. 7 of Mandatory spare list (electrical & C&I)
1.19.00	BELT WEIGHER	
1.19.01	Set of cards	2 nos. of each type
1.19.02	Load Cell	1no. for each rating/size
1.19.03	Display Unit	2 nos. of each type
1.19.04	Tacho Unit with Speed sensor	2nos.
1.19.05	Cables for load cells & speed sensor	2 sets
1.19.06	Transducer, if applicable	2 nos. of each type
1.19.07	Special Fuse	2nos. each type and rating
1.20.00	HYDRAULIC DRIVE SYSTEM	
1.20.01	Complete set of Hydraulic Pump with drive Motor for Hydraulic Power Unit	1no. each type, size & rating used in coal handling plant including Wagon Tippler, side Arm, Indexer, Apron Feeder & Conveyors.
1.20.02	Complete set of Hydraulic Motor	1no. each type, size & rating used in coal handling plant including Wagon Tippler, Apron Feeder & Conveyors.
1.20.03	Oil Hose	Two complete set (comprising of pump-end & Hydraulic Motor-end) for each type of application
1.20.04	Controller	
i.	Complete set of Controller	1no.
ii.	Power Supply Cards	2 nos. each type used in the system
iii.	Controller Cards	2 nos. each type used in the system
iv.	Interposing Relay	2 nos. each type used in the system

Mandatory Spares for CHP Conveyor Package (Mechanical)

Sl. No.	Equipment/Package Name	Quantity to be supplied by the bidder
1.20.05	Solenoid Coil for Pumps.	2 nos. each type used in the system
1.20.06	Seal kit for Pumps	2 sets each type used in the system
1.20.07	Pressure Switches	2 nos. each type used in the system
1.20.08	Pressure Transmitter	2 nos. each type used in the system
1.20.09	Temperature Switches/senser	2 nos. each type used in the system
1.20.10	Oil Level Switches	2 nos. each type used in the system
1.20.11	Filter Indicator	2 nos. each type used in the system
1.20.12	Filter Cartridge	4 nos. each type used in the system
1.20.13	Air Filter	2 nos. each type used in the system
1.20.14	Suction Line Indicator	2 nos. each type used in the system
1.21.00	COMPRESSOR	
1.21.01	Dry Air Intake Filter	5 Nos.
1.21.02	Complete set of Loading- unloading valve assembly	2 Sets (one set means complete replacement for one compressor)
1.21.03	Low Pressure Compressor element (Screw) with Drive end & Non-drive end Bearings for Male & Female Elements	1Set(one set means complete replacement for one compressor)
1.21.04	High Pressure Compressor element (Screw) with Drive end & Non-drive end Bearings for Male & Female Elements	1Set(one set means complete replacement for one compressor)
1.21.05	Air Outlet Check Valve	2Nos.
1.21.06	Air Outlet Compensator	1Set(one set means complete replacement for one compressor)
1.21.07	Lube oil filter	5Nos.
1.21.08	Lube oil Pressure Regulating valve	1No.
1.21.09	Different oil seals/O-ring for Lube oil system	2Sets(one set means complete replacement for one compressor)
1.21.10	Gear Box Unit Complete	1Set(one set means complete replacement for one compressor)
1.21.11	Coupling	
i.	Complete Set of Coupling (Motor to Compressor)	2Sets (one set means complete replacement for one compressor)
ii.	Flexible Rubber for Coupling	4Nos.
1.21.12	Drain Moisture Trap	2Sets (one set means complete replacement for one compressor)
1.21.13	Oil Pump & Motor Complete Assembly	1Set
1.21.14	Compressor Drive Motor	1No. each type
1.21.15	Compressed Air Line Valves	10% of each type and size/Class used in the system
1.21.16	PLC	1 set (applicable only in case of Micro-PLC used for the purpose). Else applicable item and quantity shall be as per Sl. No.8.03.00
1.22.00	AIR DRYING PLANT (HOC TYPE)	
a)	Pre-filter Elements	2Sets (one set means complete replacement for one drier filter)
b)	After-filter Elements	2Sets (one set means complete replacement for one drier filter)
1.23.00	Energy Chain	1 meter of each chain length with two sets of mounting brackets.
1.24.00	coal Sampling Unit	
i.	hammer	12 nos
ii.	bush for primary sampler	05 nos
iii.	cutter for primary sampler	02 nos
1.25.00	Elevator(Rack & pinion type)	
1.25.01	ELECTRO-MAGNETIC BRAKE	
i.	Tool to brake	1 no.
ii.	Fan	1 no.
iii.	Magnet Coil with housing	2 nos.
iv.	Brake Disc	6 nos.
v	Adjusting Sleeve	2 nos.

Mandatory Spares for CHP Conveyor Package (Mechanical)

Sl. No.	Equipment/Package Name	Quantity to be supplied by the bidder
vi.	Fixed Brake Disc (Pressure Plate)	2 nos.
vii	WORM GEAR	
viii	Worm Wheel	1 no.
ix	'O' ring	2 nos. of each type
x	O-Ring (Type-I)	4 Nos
xi	O-Ring (Type-II)	4 Nos
xii	Sealing ring	2 nos. of each type
xiii	Sealing Ring (Type-I)	4 Nos
1.26.0	Electrical Hoist	
1.26.01	Bearings for Long Travel Wheels [Bearing of each type and size used in motors]	1 Set for each type & capacity of Hoist
1.26.02	Bearings for Cross Travel Wheels [Bearing of each type and size used in motors]	1 Set for each type & capacity of Hoist
1.26.03	Bearings for each type of Gear Boxes of the Hoist	1 Set for each type & capacity of Hoist
1.26.04	Brake Liner for all the Brakes of the Hoist	100% for each type & capacity of Hoist
1.26.05	Hydraulic Thruster for Brakes	1 No. for each type & capacity of Hoist
1.26.06	Oil Seals for all types of the Hoist	100% for each type & capacity of Hoist
1.26.07	Brake Springs for all Brakes	100% for each type & capacity of Hoist
1.26.08	Wire Rope for Aux. Hook	100% of one Hoist for each type & capacity of Hoist
1.26.09	Electrical	
(i)	Other Electrical Spares as applicable as per the Electrical List	Applicable Item & Quantity same as indicated in Electrical list Sl. No.7.08.00,7.12.00 & 7.21.00
(ii)	Limit Switches for:	
(a)	Hoist	1 Set. for each type & capacity of Hoist
(b)	Cross Travel	1 Set. for each type & capacity of Hoist
(c)	Long Travel	1 Set. for each type & capacity of Hoist
(iii)	Control Trailing Cable for Electrical Hoist	100% of one Hoist for each type & capacity of Hoist
(iv)	Power Trailing Cable for Electrical Hoist	100% of one Hoist for each type & capacity of Hoist
NOTE:	If percentage comes as fraction next higher integer should be considered for the purpose of quantity required.	

Mandatory Spares for CHP Conveyor Package (Electrical and C&I)

Sl. No.	Equipment/Package Name	Quantity to be supplied for the Package
	Electrical Items	
2.0.00	415V System	
2	415V Air Circuit Breaker (for Each make, type and rating of ACB)	
(i)	Trip Coil	20% of total nos. or minimum 5 nos whichever is higher for each type and rating used in each switchgear (PCC/PMCC/MCC/ACDB)
(ii)	Closing Coil	20% of total nos. or minimum 5 nos whichever is higher for each type and rating used in each switchgear (PCC/PMCC/MCC/ACDB)
(iii)	Spring Charging Motor	2 nos.
(iv)	Spring Charging Motor with complete Mechanism	2 nos.
(v)	Spring Charged Limit Switch	5 nos.
(vi)	Thermal Overload for Spring Charging Motor	2 nos.
(vii)	Main Contact (Fixed and moving) assembly	5 sets (1 set consists of 3 nos.) for each type and rating
(viii)	Arcing Contact (Fixed and moving) assembly	5 sets (1 set consists of 3 nos.) for each type and rating
(ix)	Breaker Jaw Contact (Bus-end & Breaker- end) assembly	5 sets (1 set consists of 3 nos.) for each type and rating
(x)	Sliding Contact (Fixed & Moving)	3 sets.
(xi)	Breaker Auxiliary Contact Block	5 nos.
(xii)	Arcing Chute	2 sets (1 set consists of 3 nos.) for each type and rating
(xiii)	Plug Socket with Prefab cable	3 nos
(xiv)	Position Limit Switch	5 sets
3	415V MCC, ACDB, Elect. Control Panel (For each, MCC, ACDB, DCDB and Elect. Control Panel) (applicable items of PCC, PMCC, MCC, ACDB, DCDB and Elect. Control Panel shall be considered)	
(i)	Indicating Lamps complete assembly	
(a)	Red	3 nos of each make and type.
(b)	Blue	3 nos of each make and type.
(c)	Green	3 nos of each make and type.
(d)	White	3 nos of each make and type.
(e)	Amber	3 nos of each make and type.

Sl. No.	Equipment/Package Name	Quantity to be supplied for the Package
(ii)	CT	2 nos. for each make, type and Rating
(iii)	Transducer	2 no for each make, type and Rating
(iv)	Trip / Neutral / close Control Switch	2 nos. for each make, type and Rating
(v)	Switch gear or MCC / Trial / Normal selector switch	2 nos. for each make, type and Rating
(vi)	Local/Remote selector switch	2 nos. for each make, type and Rating
(vii)	AC Supply On / Off Switch	1 no. for each make, type and Rating
(viii)	DC Supply On / Off Switch	1 no. for each make, type and Rating
(ix)	Motor Heater On /Off Switch	1 no. for each make, type and Rating
(x)	DC Supply Source Selector Switch (3position)	1 no. for each make, type and Rating
(xi)	Ammeter Selector Switch	1 no. for each make, type and Rating
(xii)	Voltmeter Selector Switch	1 no. for each make, type and Rating
(xiii)	Voltmeter	2 no. for each make, type and Rating
(xiv)	Ammeter	2 no. for each make, type and Rating
(xv)	Auxiliary Control Contactor	
(a)	Auxiliary Control Contactor complete assembly	10% of total nos for each make, type and Rating.
(b)	Auxiliary Control Contactor spare kits	10% of total nos. for each make, type and Rating.
(c)	Auxiliary Control Contactor Coils	10% of total nos for each make, type and Rating.
(xvi)	Power Contactor	
(a)	Power Contactor Complete Assembly	10% of total nos for each make, type and rating
(b)	Power Contactor spare kits	10% of total nos for each make, type and Rating.
(c)	Power Contactor Coils	10% of total nos for each make, type and Rating.
(xvii)	MCCB	5% of total nos. for each make, type and rating.
(xviii)	MCB	5% of total nos. for each make, type and rating.
(xix)	Switch Fuse Unit (DC)	10% of total nos. for each make, type and rating.
(xx)	Power Fuse	5% of total nos. for each make, type and rating.
(xxi)	Control Fuse	5% of total nos. for each make, type and rating.
(xxii)	Thermal Overload Relay	5% of total nos. for each make, type and rating.
(xxii)	Sliding contact (Fixed and moving) Complete assembly	2 sets of each make, type and rating
(xxiii)	Busbar to module Lira Contact assembly	2 sets of each make, type and rating (1 set means all 3 ph+ neutral)
(xxiv)	Control and Aux. Transformer	1 no of each make, type and rating

Sl. No.	Equipment/Package Name	Quantity to be supplied for the Package
(xxv)	Delay Timer	2 no of each make, type and rating
(xxvi)	Power Terminal Block	2 sets for each make, type and rating
(xxvii)	Control Terminal Block	2 sets for each make, type and rating
(xxviii)	End plate for Power and Control terminal block	2 sets for each make, type and rating
(xxix)	Energy meter	1 no for each make, type and rating
(xxx)	Relays (Other than numerical relay):	
(a)	Conventional (Electromagnetic/Static type) Relay	2 no for each make, type and rating
(b)	Aux. relays & Lock out relays & TIMERS	2 nos for each make, type and rating
(xxxi)	MCCB Status (On/off) Monitoring Switch/Contact	2 nos for each make, type and rating
(xxxii)	Push Button (On/Off) Complete Assembly	2 nos for each make, type and rating
(xxxiii)	Annunciation Facia with lamps complete set (if applicable)	1 set for each make, type and rating
4	UPS	(applicable only for above 3KVA rating, for UPS rating equal to or less than 3 KVA one complete set shall be supplied for each area.)
4.01	Semi-conductor Fuse/HRC Fuse	3 (Three) times of total quantity of each type of fuses used in the system
4.02	SCR (if applicable)	100% of total quantity of each type used in the system
4.03	Diode	100% of total quantity of each type used in the system
4.04	IGBT	100% of total quantity of each type used in the system
4.05	Electronic Module/ PCB	
(i)	Static Switch	2(two) Nos. each type of Electronic Card/PCB/modules used in the system
(ii)	Inverter	2(two) Nos. each type of Electronic Card/PCB/modules used in the system
(iii)	Static voltage Regulator	2(two) Nos. each type of Electronic Card/PCB/modules used in the system
(iv)	Charger	2(two) Nos. each type of Electronic Card/PCB/modules used in the system
4.06	UPS Battery (Ni-Cad Type)	
(i)	Battery Cell (Uncharged, Dry)	10Nos. each type
(ii)	Inter connecting cell strips	10Nos. each type
(iii)	Vent cap	10Nos. each type
(iv)	Hydrometer	1No.
(v)	Rubber gloves	1Pair
(vi)	Voltmeter for measuring cell voltage (Center zero type)	1No.
(vii)	Funnel	1No.

Sl. No.	Equipment/Package Name	Quantity to be supplied for the Package
(viii)	Jug	1No.
(ix)	Apron & Goggles	1Set
(x)	Cell lifting puller	1No.
(xi)	Insulated socket spanner with handle	1No.
(xii)	Terminal screw with Belleville washer	5% of total quantity used
(xiii)	Plastic filling bottle	1No.
(xiv)	Thermometer	1No.
5	Other Electrical Items	For other applicable items Sl No.2, 3 & 6 of this document shall be followed.
6	Control Panel/Desk Mounted Items	
6.01	Push Button Complete assembly	10Nos for each colour
6.02	Push Button Contact Element (1NO + 1NC) Block	20Nos.
6.03	Selector Switch	10Nos. for each type and rating
6.04	Meter (Analog and Digital)	
(i)	Ammeter	2Nos. for each type and range
(ii)	Voltmeter	2Nos. for each type and range
(iii)	Frequency	2Nos. for each type and range
(iv)	MW	2Nos. for each type and range
(v)	MVAR	2Nos. for each type and range
(vi)	Power Factor	2Nos. for each type and range
(vii)	Synchroscope	1No. for each type and range
(viii)	Synchrocheck Relay complete set	1No. for each type and range
(ix)	Transducer	1No. for each type and range
6.05	Indicating Lamps complete assembly	20Nos. for each Colour and type
6.06	Mimic Lamps	10Nos. for each Colour and type
6.07	MCB	5Nos. for each type and rating
6.08	Door Limit Switch	5Nos.
6.09	Annunciation system	
(i)	Lamp Box with Facia & Lamps (LED type)	25Nos.
(ii)	Hooter	1No.
(iii)	Each type of PCB (for non-PLC driven system)	1(one) no.
7	Actuator	

Sl. No.	Equipment/Package Name	Quantity to be supplied for the Package
7.01	Complete set of Actuator	2Nos. for each type, make and rating, 1 no. for H2 cooler Temperature controller and 1 no. for stator water temperature controller
7.01	Power Unit for Modulating Actuator	4Nos. of each type
7.02	DC-DC Power Pack Unit	4Nos. of each type
7.03	Electronic cards	4Nos. of each type
7.04	Position Feed Back Transmitters	4Nos. of each type
7.05	Control Unit	4Nos. of each type
7.06	Limit Switch Assembly	2 Nos each type and rating
7.07	Torque Switch Assembly	2 Nos each type and rating
7.08	Power Contactor	5Nos. for each type and rating
7.09	Auxiliary Contactor	5Nos. for each type and rating
7.10	Thermal Over Load Relay	2Nos. for each type and rating
7.11	Motor	1No. each type and rating
7.12	Complete Seal kit	2Sets for each type and rating
7.13	Complete O-Ring Set	2Sets for each type and rating
8	Motor	
8.01	11 KV & 3.3 KV Motor	
(i)	Motor of each type and rating (Note : motors covered in mechanical spare items need not to be included here)	10% of the installed quantity or minimum 1 number whichever be higher
(ii)	Neutral End Terminal Bushing with Fasteners	1 no. for each type and rating of Motor
(iii)	Bearing Temperature Gauge Driving & Non-Driving End	1 set for each type and rating of Motor
(iv)	Phase segregated terminal boxes	2 Nos. for each type and rating of Motor
(v)	Heaters	2 sets for each type and rating of Motor
(vi)	Complete Set of Coupling	1 set for each type and rating of Motor
(vii)	Bearings (DE) for each type and rating of motors	2 sets for each type and rating of Motor
(viii)	Bearings (NDE) for each type and rating of motors	2 sets for each type and rating of Motor
(ix)	Cooling Fan Internal & External	1 set for each type and rating of Motor
(x)	Neutral CT for differential protection (For motor rating >1000 KW)	2 no of each type and rating.
(xi)	End Termination kits	2 Nos. of each type and rating
(xii)	Indicating Instruments/gauges other than Bearing temperature gauge (as applicable)	1 set for each type and rating of Motor
(xiii)	Phase side Bushing and Insulator	1Set for each type and rating of Motor
(xiv)	Oil Seal Ring (as applicable)	1Set for each type and rating of Motor
8.02	415 Volt Motor	

Sl. No.	Equipment/Package Name	Quantity to be supplied for the Package
(i)	Motor of each type and rating (Note : motors covered in mechanical spare items need not to be included here again) 10% of the installed quantity or minimum 1 number whichever be higher	10% of the installed quantity or minimum 1 number whichever be higher
(ii)	End Shield Cover Driving & Non-Driving End	1 set for each type and rating of Motor
(iii)	Heaters	2 sets for each type and rating of motor
(iv)	Bearings (DE and NDE) for each type and rating of motor	2 sets
(v)	Cooling Fan for all type and rating of LT motors	One (1) set
(vi)	Dust seals and gaskets for each type of motors	1 Set
(vii)	Motor Terminal Block	1 no. for each type and rating of Motor
(viii)	Complete Set of Coupling	1 set for each type and rating
9	Local Control Station	
9.01	Local Control Station Complete Set for all type of drives	2 nos for each make, type and rating
9.02	Push button complete set	5 nos for each make, type and rating
10	Control & Instrumentation	
10.01	Electronic Transmitters	
(i)	Pressure	1(One) no. complete set for each type and model/range used in the system
(ii)	Differential Pressure	1(One) no. complete set for each type and model/range used in the system
(iii)	Level	1(One) no. complete set for each type and model/range used in the system
(iv)	Speed	1(One) no. complete set for each type and model/range used in the system
(v)	FlowTransmitter	1(One) no. complete set for each type and model/range used in the system
(vi)	3-D Ultrasonic level Transmitter	1(One) no. complete set for each type and model/range used in the system
10.02	Different type of Switches	
(i)	Pressure Switch	2(two)no. of each type & model/range used in the system
(ii)	Differential Pressure Switch	2(two)no. of each type & model/range used in the system
(iii)	Level Switch	2(two)no. of each type & model/range used in the system
(iv)	Flow Switch	2(two)no. of each type & model/range used in the system

Sl. No.	Equipment/Package Name	Quantity to be supplied for the Package
(v)	Temperature Switch	2(two)no. of each type & model/range used in the system
(vi)	Dust Detector	1(one)no. of each type & model used in the system
10.03	Thermocouple	100% of each type and length used in one unit
10.04	RTD	100% of each type and length used in one unit
10.05	Thermo-well for both TC and RTD	2(Two) nos. for each type and rating/length used in the system
10.06	Solenoid Valve	
(i)	Complete Solenoid Valve Assembly	2Nos. for each type and rating used in the system
(ii)	Coil (single or double coil type)	10% of total nos. used in the system or minimum 5(five) Nos. whichever is more for each type and rating.
12	Different types of Gauge	10% of total nos. used in the system or minimum 1(one) no. whichever is more for each type and range.
(i)	Pressure Gauge	10% of total nos. used in the system or minimum 1(one) no. whichever is more for each type and range.
(ii)	Differential Pressure Gauge	10% of total nos. used in the system or minimum 1(one) no. whichever is more for each type and range.
(iii)	Temperature Gauge	10% of total nos. used in the system or minimum 1(one) no. whichever is more for each type and range.
(iv)	Magnetic Level Gauge	10% of total nos. used in the system or minimum 1(one) no. whichever is more for each type and range.
10.07	Air Filter Regulator including separator complete set with gauges	10Nos.
10.08	Rotameter	10% of total nos. used in the system or minimum 2(Two) nos. whichever is more for each type, rating,/model and size used in the system.
10.09	Gauge Glass	1No. for each type and size
10.10	Erection Hardware	
(i)	Transmitter's Manifold	10% of total nos. used in the system or minimum 2(Two) nos. whichever is more for each type, rating,/model and size used in the system.
(ii)	Impulse Line Root/Source valve	10% of total nos. used in the system or minimum 4(four) nos. whichever is more for each type, rating,/model and size used in the system.
(iii)	Impulse Line Isolation valve	10% of total nos. used in the system or minimum 4(four) nos. whichever is more for each type, rating,/model and size used in the system.
(iv)	Impulse Line Drain valve	10% of total nos. used in the system or minimum 4(four) nos. whichever is more for each type, rating,/model and size used in the system.
(v)	Impulse Line fittings	Each type/size 25Nos.

Sl. No.	Equipment/Package Name	Quantity to be supplied for the Package
(vi)	Impulse Pipe	Each type/size 100Mtrs.
(vii)	Copper/SS Tube	Each type/size 100Mtrs.
(viii)	Fittings for Copper/SS Tube	Each type/size 100Nos.
10.11	Conductivity Type Level Switch	
(i)	Conductivity Ttype level Probes	10% of total nos. used in the system or minimum 4(four) nos. whichever is more.
(ii)	Complete Electronics unit	1Set
(iii)	Isolating/Root Valve	2Nos.
10.12	Cold Junction Compensation Boxes	10% of total nos. used in the system or minimum 2(two) nos. for each type/size whichever is more.
10.13	Current/Voltage Transducers	1(one) no. each type/rating used in the system
10.14	MWatt/MVAR Transducer	1(one) no. each type/rating used in the system
11	Pneumatic Control Valve & Power Cylinder (Applicable for all Modulating Type & OnOff/Isolating Type)	
11.01	Control Valve	
(i)	Pneumatic Diaphragm for Diaphragm actuated valve	2(two) nos. for each type of Actuator
(ii)	Actuator Seal Kit for Pneumatic Cylinder actuated valve	2(two) nos. for each type of Actuator
(iii)	Gland Packing	1(one) set for each type of Control Valve
(iv)	Stem	1(one) No. for each type of Control Valve
(v)	Plug	1(one) No. for each type of Control Valve
(vi)	Seat	1(one) No. for each type of Control Valve
(vii)	Cage	1(one) No. for each type of Control Valve
(viii)	Retainer Ring	1(one) set for each type of Control Valve
(ix)	Seal Ring	1(one) set for each type of Control Valve
(x)	Gasket	2(two) Sets. for each type of Control Valve
(xi)	Smart Positioner of the Valve	10% of total quantity used in the system or minimum 2(two) nos. whichever is more for each type and model.
(xii)	Seal Kit for the Positioner	2(two) Sets. for each type of Positioner
(xiii)	Position Feedback Transmitter (applicable if it is not integral with the Smart Positioner)	10% of total quantity used in the system or minimum 2(two) nos. whichever is more for each type and model.
(xiv)	Complete Set of Solenoid Valve for Pneumatic type On/Off Valve	2Nos. for each type & ratings
(xv)	Solenoid Coil for Pneumatic type On/Off Valve	5Nos. for each type & ratings
12	Control Panel And Local/Remote Control Desk	

Sl. No.	Equipment/Package Name	Quantity to be supplied for the Package
12.01	Mosaic/Conventional Type Push button Station	10% of total quantity used in the system or minimum 2(two) nos. whichever is more for each type and model.
12.02	Mosaic Type Push button Station with LED Indication	10% of total quantity used in the system or minimum 2(two) nos. whichever is more for each type and model.
12.03	Mosaic Type LED Indication Station	10% of total quantity used in the system or minimum 2(two) nos. whichever is more for each type and model.
12.04	Simaphore Indicator	2(two)Nos. each type
12.05	Annunciation System	
(i)	Each type of PCB (for non-PLC driven system)	1(one) No. each
(ii)	Lamp Box with Facia & Lamps (LED type)	10(ten)Nos.
(iii)	Hooter	1(one) No.
Note:	Mandatory spares shall be packed separately in boxes and to be identified in bold as "MANDATORY SPARES" with proper serial no. and packing list. Separate documentation, Test reports should be prepared for Mandatory spares, it should not be clubbed with main supply items.	



ANNEXURE#9
of
TECHNICAL ENQUIRY SPECIFICATION
for
Coal Handling Plant Conveyor System

for
SAGARDIGHI THERMAL POWER PROJECT
1 x 660 MW UNIT NO. 5, PHASE – III
WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED

Content:

List of Drawings (LOD) with submission schedule to be submitted during detail engineering

ISG MDL(CHP) - 1X660 MW Sagardighi TPP, Extension, Unit-5

S.N.	Type of Doc D-Drawing Q-Quality Plan V-Vendor List	Drawing No	Title	Area/System	Purpose	Scheduled submission weeks after LOI date
1	D	IS-DG-445-100-A001	COAL FLOW DIAGRAM	Mechanical-CHP	A	-
2	D	IS-DG-445-100-A002	LAYOUT OF COAL HANDLING PLANT	Mechanical-CHP	A	-
3	D	IS-DG-445-101-A003	TYPICAL CROSS SECTION OF GALLERY & TUNNEL	Mechanical-CHP	A	-
4	D	IS-DG-445-101-A004	CONVEYOR PROFILE FOR ALL CONVEYOR	Mechanical-CHP	A	2
5	D	IS-DG-445-100-A005	DESIGN MEMORANDUM FOR CHP	Mechanical-CHP	A	4
6	D	IS-DG-445-101-A006	GA AND LOADDATA OF BCN-23A/B	Mechanical-CHP	A	4
7	D	IS-DG-445-101-A007	GA AND LOADDATA OF BCN-24A/B	Mechanical-CHP	A	4
8	D	IS-DG-445-101-A008	GA AND LOADDATA OF BCN-25A/B	Mechanical-CHP	A	4
9	D	IS-DG-445-101-A009	GA AND LOADDATA OF BCN-29A/B	Mechanical-CHP	A	4
10	D	IS-DG-445-101-A010	GA AND LOADDATA OF BCN-30A/B	Mechanical-CHP	A	4
11	D	IS-DG-445-101-A011	GA AND LOADDATA OF BCN-31A/B	Mechanical-CHP	A	4
12	D	IS-DG-445-101-A012	GA AND LOADDATA OF BCN-32A/B	Mechanical-CHP	A	4
13	D	IS-DG-445-101-A013	GA AND LOADDATA OF BCN-33A/B	Mechanical-CHP	A	4
14	D	IS-DG-445-101-A014	GA AND LOADDATA OF BCN-34A/B	Mechanical-CHP	A	4
15	D	IS-DG-445-101-A015	GA AND LOADDATA OF BCN-35A/B	Mechanical-CHP	A	4
16	D	IS-DG-445-101-A016	GA AND LOADDATA OF BCN-36A/B	Mechanical-CHP	I	4
17	D	IS-DG-445-101-A017	G.A. OF REVERSIBLE BELT FEEDER RBF-1, 2 & 3 AT CRH	Mechanical-CHP	A	6
18	D	IS-DG-445-116-A018	G.A. OF TRAVELLING TRIPPER	Mechanical-CHP	A	8
19	D	IS-DG-445-107-A019	GA AND LOAD DATA OF CRUSHER HOUSE CRH	Mechanical-CHP	A	10
20	D	IS-DG-445-104-A020	GA AND LOAD DATA OF TP-19 (EXISTING)	Mechanical-CHP	I	4
21	D	IS-DG-445-104-A021	GA AND LOAD DATA OF TP-20	Mechanical-CHP	A	4
22	D	IS-DG-445-104-A022	GA AND LOAD DATA OF TP-21	Mechanical-CHP	I	4
23	D	IS-DG-445-104-A023	GA AND LOAD DATA OF TP-23	Mechanical-CHP	A	4
24	D	IS-DG-445-104-A024	GA AND LOAD DATA OF TP-24	Mechanical-CHP	I	4
25	D	IS-DG-445-104-A025	GA AND LOAD DATA OF TP-25	Mechanical-CHP	A	4
26	D	IS-DG-445-104-A026	GA AND LOAD DATA OF TP-26	Mechanical-CHP	I	6
27	D	IS-DG-445-104-A027	GA AND LOAD DATA OF TP-27	Mechanical-CHP	A	6
28	D	IS-DG-445-104-A028	GA AND LOAD DATA OF TP-28	Mechanical-CHP	I	6
29	D	IS-DG-445-112-A029	GA OF CHP PUMP HOUSE	Mechanical-CHP	A	10
30	D	IS-DG-445-127-A030	GA OF DOZER SHED	Mechanical-CHP	A	6
31	D	IS-DC-445-101-A031	POWER & BELT TENSION CALCULATION FOR CONVEYORS	Mechanical-CHP	A	3
32	D	IS-DC-445-101-A032	POWER & BELT TENSION CALCULATION FOR RBF- 1,2 & 3	Mechanical-CHP	A	3
33	D	IS-DC-445-116-A033	MOTOR RATING & WHEEL LOAD CALC. FOR TRAVELLING TRIPPER	Mechanical-CHP	A	6
34	D	IS-DC-445-111-A034	MOTOR RATING CALC. FOR R.P.GATE	Mechanical-CHP	A	6
35	D	IS-DC-445-111-A035	MOTOR RATING CALC. FOR FLAP GATE	Mechanical-CHP	A	6
36	D	IS-DG-445-100-A036	PULLEY SCHEDULE	Mechanical-CHP	I	14
37	D	IS-DG-445-100-A037	IDLER SCHEDULE	Mechanical-CHP	I	6
38	D	IS-DG-445-100-A038	HOIST SCHEDULE	Mechanical-CHP	I	23
39	D	IS-DG-445-111-A039	G.A. OF FLAP GATE	Mechanical-CHP	I	14
40	D	IS-DG-445-111-A040	G.A. OF R.P GATE	Mechanical-CHP	I	4
41	D	IS-DG-445-111-A041	G.A. OF ROD GATE	Mechanical-CHP	I	4
42	D	IS-DG-445-111-A042	GA OF GEAR BOX FOR BELT FEEDER	Mechanical-CHP	I	11
43	D	IS-DG-445-111-A043	GA OF FLUID COUPLING FOR BELT FEEDER	Mechanical-CHP	I	15
44	D	IS-DG-445-111-A044	GA OF GEAR COUPLING FOR BELT FEEDER	Mechanical-CHP	I	14
45	D	IS-DG-445-111-A045	ELECTRO HYDRAULIC THRUSTER BRAKE FOR BELT FEEDER AND TRIPPER	Mechanical-CHP	I	14
46	D	IS-DG-445-111-A046	GA OF HYDRAULIC DRIVE SYSTEM FOR CONV 23A&B	Mechanical-CHP	I	10
47	D	IS-DG-445-111-A047	GA OF HYDRAULIC DRIVE SYSTEM FOR CONV 24A&B	Mechanical-CHP	I	10
48	D	IS-DG-445-111-A048	GA OF HYDRAULIC DRIVE SYSTEM FOR CONV 25A&B	Mechanical-CHP	I	10

ISG MDL(CHP) - 1X660 MW Sagardighi TPP, Extension, Unit-5						
S.N.	Type of Doc D-Drawing Q-Quality Plan V-Vendor List	Drawing No	Title	Area/System	Purpose	Scheduled submission weeks after LOI date
49	D	IS-DG-445-111-A049	GA OF HYDRAULIC DRIVE SYSTEM FOR CONV 29A&B	Mechanical-CHP	I	10
50	D	IS-DG-445-111-A050	GA OF HYDRAULIC DRIVE SYSTEM FOR CONV 30A&B	Mechanical-CHP	I	10
51	D	IS-DG-445-111-A051	GA OF HYDRAULIC DRIVE SYSTEM FOR CONV 31A&B	Mechanical-CHP	I	10
52	D	IS-DG-445-111-A052	GA OF HYDRAULIC DRIVE SYSTEM FOR CONV 32A&B	Mechanical-CHP	I	10
53	D	IS-DG-445-111-A053	GA OF HYDRAULIC DRIVE SYSTEM FOR CONV 33A&B	Mechanical-CHP	I	10
54	D	IS-DG-445-111-A054	GA OF HYDRAULIC DRIVE SYSTEM FOR CONV 34A&B	Mechanical-CHP	I	10
55	D	IS-DG-445-111-A055	GA OF HYDRAULIC DRIVE SYSTEM FOR CONV 35A&B	Mechanical-CHP	I	10
56	D	IS-DG-445-111-A056	GA OF HYDRAULIC DRIVE SYSTEM FOR CONV 36A&B	Mechanical-CHP	I	10
57	D	IS-DC-445-111-A057	DESIGN CALCULATION FOR COAL SAMPLING SYSTEM	Mechanical-CHP	I	8
58	D	IS-DG-445-111-A058	TECHNICAL DATA SHEET - CONVEYOR BELTING	Mechanical-CHP	A	8
59	D	IS-DG-445-111-A059	DATASHEET FOR CONVEYOR BELT FOR BELT FEEDER & BUNKER SEALING BELT	Mechanical-CHP	I	12
60	D	IS-DG-445-111-A060	G.A. OF ROTARY ACTUATOR FOR RP GATE	Mechanical-CHP	I	15
61	D	IS-DG-445-111-A061	G.A. OF LINEAR ACTUATOR FOR FLAP GATE	Mechanical-CHP	I	15
62	D	IS-DG-445-111-A062	G.A. OF BELT WEIGHER	Mechanical-CHP	I	6
63	D	IS-DG-445-111-A063	G.A. OF METAL DETECTOR	Mechanical-CHP	I	6
64	D	IS-DG-445-111-A064	G.A. OF ILMs	Mechanical-CHP	I	3
65	D	IS-DG-445-111-A065	G.A. OF SUSPENDED MAGNET	Mechanical-CHP	I	3
66	D	IS-DG-445-111-A066	G.A. OF COAL SAMPLING SYSTEM AT CRH	Mechanical-CHP	I	4
67	D	IS-DG-445-111-A067	G.A. OF COAL SAMPLING SYSTEM AT TP-27	Mechanical-CHP	I	4
68	D	IS-DG-445-125-A068	G.A. & DATASHEET OF RACK & PINION TYPE ELEVATOR FOR CRUSHER HOUSE	Mechanical-CHP	I	11
69	D	IS-DG-445-125-A069	GA & DATASHEET OF RACK & PINION TYPE ELEVATOR FOR TP-20	Mechanical-CHP	I	12
70	D	IS-DG-445-111-A070	G.A. OF ELECTRICAL HOIST	Mechanical-CHP	I	15
71	D	IS-DG-445-111-A071	GA OF MANUAL HOIST & CHAIN PULLEY BLOCK FOR CHP	Mechanical-CHP	I	15
72	D	IS-DG-445-103-A072	G.A. OF EOT CRANE	Mechanical-CHP	I	17
73	D	IS-DG-445-111-A073	GA OF EXTERNAL BELT SCRAPER FOR CONVEYORS (PRIMARY)	Mechanical-CHP	I	9
74	D	IS-DG-445-111-A074	GA OF EXTERNAL BELT SCRAPER FOR CONVEYORS (SECONDARY)	Mechanical-CHP	I	9
75	D	IS-DG-445-111-A075	G.A. OF INTERNAL SCRAPER	Mechanical-CHP	I	7
76	D	IS-DG-445-111-A076	G.A. OF SUMP PUMP	Mechanical-CHP	I	21
77	D	IS-DG-445-111-A077	G.A. OF GATE VALVE FOR SUMP PUMP SYSTEM	Mechanical-CHP	I	26
78	D	IS-DG-445-111-A078	GA OF SKIRT SEALING SYSTEM FOR CONVEYORS	Mechanical-CHP	I	15
79	D	IS-DG-445-116-A079	GA AND DATASHEET FOR ENERGY CHAIN FOR TRIPPER	Mechanical-CHP	I	21
80	D	IS-DG-445-116-A080	AUTOMATIC RAIL CLAMP FOR TRIPPER	Mechanical-CHP	I	21
82	D	IS-DG-445-127-A082	DETAILS OF BOBCAT	Mechanical-CHP	I	23
103	D	IS-DG-445-107-A103	GA OF CRUSHER (RING GRANULATOR)	Mechanical-CHP	A	11
104	D	IS-DG-445-107-A104	GA OF ROLLER SCREEN	Mechanical-CHP	A	12
105	D	IS-DG-445-107-A105	GA OF SCOOP TYPE COUPLING FOR RING GRANULATOR	Mechanical-CHP	A	12
106	D	IS-DG-445-124-A106	G.A. OF VIBRATION ISOLATION SYSTEM FOR CRUSHERS	Mechanical-CHP	I	23
107	D	IS-DG-445-111-A107	TYPICAL GA OF CHUTE WORK	Mechanical-CHP	A	10
108	D	IS-DG-445-111-A108	TYPICAL GA OF SKIRT BOARD	Mechanical-CHP	I	6

ISG MDL(CHP) - 1X660 MW Sagardighi TPP, Extension, Unit-5

S.N.	Type of Doc D-Drawing Q-Quality Plan V-Vendor List	Drawing No	Title	Area/System	Purpose	Scheduled submission weeks after LOI date
109	D	IS-DG-445-111-A109	GA OF CHUTE VIBRATOR	Mechanical-CHP	I	33
110	D	IS-DG-445-110-A110	DESIGN BASIS REPORT FOR TUNNEL VENTILATION SYSTEM	Mechanical-CHP	A	11
111	D	IS-DG-445-110-A111	DUCTING LAYOUT FOR TUNNEL VENTILATION SYSTEM FOR WAGAON TIPPLER AREA AND CONV 29A/B	Mechanical-CHP	A	14
112	D	IS-DG-445-110-A112	DBR FOR PRESSURISED VENTILATION FOR CHP MCC ROOMS	Mechanical-CHP	I	11
113	D	IS-DG-445-110-A113	DUCT LAYOUT OF PRESSURIZED VENTILATION SYSTEM FOR CHP PMCC-NEAR WT	Mechanical-CHP	A	18
114	D	IS-DG-445-110-A114	DUCT LAYOUT OF PRESSURIZED VENTILATION SYSTEM FOR CHP PMCC-NEAR CRH	Mechanical-CHP	A	18
115	D	IS-DG-445-110-A115	DUCT LAYOUT OF PRESSURIZED VENTILATION SYSTEM FOR CHP PMCC-NEAR BUNKER	Mechanical-CHP	A	18
116	D	IS-DG-445-110-A116	GA DRAWING OF FAN FOR PRESSURIZED VENTILATION SYSTEM	Mechanical-CHP	I	29
117	D	IS-DG-445-110-A117	GA DRAWING OF FAN FOR TUNNEL VENTILATION SYSTEM	Mechanical-CHP	I	29
118	D	IS-DC-445-110-A118	CAPACITY CALCULATION FOR A/C SYSTEM IN CHP CONTROL ROOM	Mechanical-CHP	A	14
119	D	IS-DG-445-110-A119	SCHEMATIC DIAGRAM FOR DFDS & DS SYSTEMS	Mechanical-CHP	A	15
120	D	IS-DG-445-110-A120	DESIGN BASIS REPORT FOR DFDS & DS SYSTEMS	Mechanical-CHP	A	15
121	D	IS-DG-445-110-A121	SCHEMATIC FOR CW, SW & PW SYSTEMS	Mechanical-CHP	A	15
122	D	IS-DG-445-110-A122	DESIGN BASIS REPORT FOR CW, SW & PW SYSTEMS	Mechanical-CHP	A	15
123	D	IS-DG-445-112-A123	GA, DATASHEET & CURVE OF PUMPS FOR DS,DFDS,SW,PW & CW SYSTEM	Mechanical-CHP	I	32
124	D	IS-DG-445-112-A124	GA & DATA SHEET OF SCREW COMPRESSOR FOR DFDS SYSTEM	Mechanical-CHP	I	32
125	D	IS-DG-445-112-A125	GA OF VERTICAL AIR RECEIVER FOR CHP	Mechanical-CHP	I	32
126	D	IS-DG-445-112-A126	DATA SHEET FOR PIPE & PIPE FITTINGS FOR DFDS,DS,PW & SW SYSTEM	Mechanical-CHP	I	32
127	D	IS-DG-445-112-A127	GA OF SPRAY NOZZLE FOR DFDS SYSTEM	Mechanical-CHP	I	32
128	D	IS-DG-445-112-A128	GA & DATA SHEET FOR SOLENOID VALVE FOR DS & DFDS SYSTEM	Mechanical-CHP	I	32
129	D	IS-DG-445-112-A129	GA DRG OF FCU, FCU_D, CCU, PRU FOR DFDS & SB BOX FOR DS SYSTEM	Mechanical-CHP	I	32
130	D	IS-DG-445-112-A130	GA OF DUPLEX STRAINER FOR DFDS, DS, SW & PW SYSTEM	Mechanical-CHP	I	32
131	D	IS-DG-445-112-A131	GA OF CI, FS & SS VALVES FOR DFDS, DS, PW & SW SYSTEM	Mechanical-CHP	I	32
132	D	IS-DG-445-112-A132	GA OF HOSE REELING DRUM FOR SW SYSTEM	Mechanical-CHP	I	32
133	D	IS-DG-445-112-A133	DATA SHEET & CATALOGUE OF PVC TANK FOR PW SYSTEM	Mechanical-CHP	I	32
134	D	IS-DG-445-112-A134	VALVE SCHEDULE FOR CHP WATER SYSTEM	Mechanical-CHP	I	24
135	D	IS-DG-445-112-A135	GA, DATASHEET & CURVE OF AXIAL FAN WITH MOTOR FOR DS PUMP HOUSE	Mechanical-CHP	I	32
136	D	IS-DG-445-110-A136	DESIGN BASIS REPORT OF DE SYSTEM	Mechanical-CHP	A	11
137	D	IS-DG-445-110-A137	SCHEMATIC DIAGRAM FOR DE SYSTEM	Mechanical-CHP	A	11
138	D	IS-DG-445-110-A138	GA OF CENTRIFUGAL FANS FOR DE SYSTEM	Mechanical-CHP	I	32
139	D	IS-DG-445-110-A139	GA OF BAG FILTER FOR DE SYSTEM	Mechanical-CHP	I	32
140	D	IS-DG-445-110-A140	GA OF AIR RECEIVER FOR DE SYSTEMS	Mechanical-CHP	I	32
141	D	IS-DG-445-110-A141	GA OF AIR COMPRESSOR FOR DE SYSTEM	Mechanical-CHP	I	32
142	D	IS-DG-445-110-A142	GA OF AIR DRIER FOR DE SYSTEM	Mechanical-CHP	I	32

ISG MDL(CHP) - 1X660 MW Sagardighi TPP, Extension, Unit-5

S.N.	Type of Doc D-Drawing Q-Quality Plan V-Vendor List	Drawing No	Title	Area/System	Purpose	Scheduled submission weeks after LOI date
143	D	IS-DG-445-110-A143	GA & DATA SHEET OF ROTARY AIR LOCK VALVE FOR DE SYSTEM	Mechanical-CHP	I	32
144	D	IS-DG-445-110-A144	DUCTING LAYOUT FOR DE SYSTEM AT CRH	Mechanical-CHP	A	24
145	D	IS-DG-445-110-A145	DUCTING LAYOUT FOR DE SYSTEM AT BUNKERS	Mechanical-CHP	A	24
146	D	IS-DG-445-100-A146	PAINTING SPECIFICATIONS	Mechanical-CHP	I	8
147	D	IS-OM-445-100-A147	O & M MANUALS	Mechanical-CHP	I	63
148	D	IS-MQ-445-100-A148	PG TEST PROCEDURE FOR CHP	Mechanical-CHP	A	37
149	Q	IS-FQ-445-100-A149	FIELD QUALITY PLAN FOR CHP MECHANICAL	Mechanical-CHP	A	37
150	Q	IS-MQ-445-101-A150	INSPECTION PLAN FOR CONVEYOR PKG	Mechanical-CHP	I	8
152	Q	IS-MQ-445-107-A152	QAP-CRUSHER	Mechanical-CHP	A	24
153	Q	IS-MQ-445-107-A153	QAP-ROLLER SCREEN	Mechanical-CHP	A	24
158	Q	IS-MQ-445-111-A158	QAP OF IDLERS	Mechanical-CHP	A	24
159	Q	IS-MQ-445-111-A159	QAP OF PULLEY	Mechanical-CHP	A	24
160	Q	IS-MQ-445-111-A160	QAP OF TECHNOLOGICAL STRUCTURE	Mechanical-CHP	A	24
161	Q	IS-MQ-445-116-A161	QAP OF TRAVELLING TRIPPER	Mechanical-CHP	A	24
162	Q	IS-MQ-445-111-A162	QAP OF RPG & ROD GATES	Mechanical-CHP	A	24
163	Q	IS-MQ-445-111-A163	QAP OF GEAR BOX FOR BELT FEEDER	Mechanical-CHP	A	24
164	Q	IS-MQ-445-111-A164	QAP OF FLUID COUPLING FOR BELT FEEDER	Mechanical-CHP	A	24
165	Q	IS-MQ-445-111-A165	QAP OF GEAR COUPLING	Mechanical-CHP	A	24
166	Q	IS-MQ-445-111-A166	QAP OF SCOOP TYPE COUPLING FOR RING GRANULATOR	Mechanical-CHP	A	24
167	Q	IS-MQ-445-124-A167	QAP OF VIBRATION ISOLATION SYSTEM	Mechanical-CHP	A	24
168	Q	IS-MQ-445-111-A168	QAP OF METAL DETECTOR	Mechanical-CHP	A	24
169	Q	IS-MQ-445-111-A169	QAP OF BELT WEIGHERS	Mechanical-CHP	A	24
170	Q	IS-MQ-445-111-A170	QAP OF MAGNETIC SEPARATORS	Mechanical-CHP	A	24
171	Q	IS-MQ-445-111-A171	QAP OF SUSPENDED MAGNET	Mechanical-CHP	A	24
172	Q	IS-MQ-445-111-A172	QAP OF FLAP GATE	Mechanical-CHP	A	24
174	Q	IS-MQ-445-111-A174	QAP OF HYDRAULIC SYSTEM FOR CONVEYORS	Mechanical-CHP	A	24
175	Q	IS-MQ-445-125-A175	QAP OF ELEVATOR FOR CHP	Mechanical-CHP	A	24
177	Q	IS-MQ-445-111-A177	QAP OF COAL SAMPLING UNIT	Mechanical-CHP	A	24
178	Q	IS-MQ-445-111-A178	QAP OF SUMP PUMP	Mechanical-CHP	A	32
179	Q	IS-MQ-445-111-A179	QAP OF CONVEYOR BELT	Mechanical-CHP	A	32
180	Q	IS-MQ-445-110-A180	QAP OF DE SYSTEM EQUIPMENTS	Mechanical-CHP	A	32
181	Q	IS-MQ-445-111-A181	QAP OF BRAKE FOR BELT FEEDER AND TRIPPER	Mechanical-CHP	A	24
182	Q	IS-MQ-445-111-A182	QAP OF ELECTRIC HOIST	Mechanical-CHP	A	24
183	Q	IS-MQ-445-111-A183	QAP OF MANUAL HOIST & CHAIN PULLEY BLOCK	Mechanical-CHP	A	24
184	Q	IS-MQ-445-111-A184	QAP OF DFDS, DS, SW, PW, CW SYSTEM FOR CHP	Mechanical-CHP	A	32
185	Q	IS-MQ-445-111-A185	QAP OF ACTUATOR	Mechanical-CHP	A	24
186	Q	IS-MQ-445-116-A186	QAP OF RAIL CLAMP FOR TRIPPER	Mechanical-CHP	A	24
187	Q	IS-MQ-445-111-A187	QAP OF EXTERNAL SCRAPPERS & SKIRT SEALING	Mechanical-CHP	A	24
188	Q	IS-MQ-445-111-A188	QAP OF BELT FOR BELT FEEDER & BUNKER SEALING	Mechanical-CHP	A	24
190	Q	IS-MQ-445-116-A190	QAP OF E-CHAIN FOR TRIPPER	Mechanical-CHP	A	24
193	Q	IS-MQ-445-110-A193	QAP OF VENTILATION & AC SYSTEM FOR CHP	Mechanical-CHP	A	32



ANNEXURE#10
of
TECHNICAL ENQUIRY SPECIFICATION
for
Coal Handling Plant Conveyor System

for
SAGARDIGHI THERMAL POWER PROJECT
1 x 660 MW UNIT NO. 5, PHASE – III
WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED

Content:

IMPORTANT FORMATS TO BE FOLLOWED

[illegible]

Inspection Categorization

Cat-1 inspection : WBPDC/DCPL & BHEL(or BHEL TPI) along with VENDOR

Cat-2 inspection : BHEL(or BHEL TPI) along with VENDOR

Cat-3 inspection : VENDOR

SMI : SELF MANUFACTURE ITEMS

BOI: BOUGHT-OUT ITEMS

Type of packaging

OP' - Open Type

'PP' - Partially Packed

'CP' - Crate Packing - Components/Equipments

requiring physical protection

'CQ' - Case Packing - Small medium Components/

Assemblies/ Equipments which

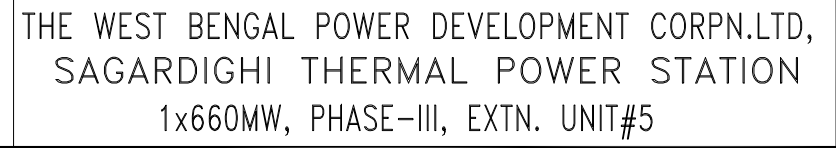
require corrosion & physical protection

'CR' - Case Packing - Electrical

Components/Assemblies which require special

packing viz. Water Proof, Shock Proof, etc.

'VCI' - Volatile Corrosion Inhibitor Paper:



								VENDOR LOGO	VENDOR NAME		NAME	SIGN	DATE
										DRN.	-		-
										CHD.	-		-
										APPD.	-		-
								TITLE :	COAL FLOW DIAGRAM				
								BHEL JOB. NO.:	IS-1-18-2006	STATUS OF DRG.: FOR APPROVAL			
REV.	STATUS	TYPE	REASONS FOR REVISION		DRAWN	CHECKED	APPROVED	DATE	UNIT : —	SCALE : —	BELO DWG. NO. : IS-DG-445-100-A001		REV. R0

MFGR.'s LOGO	MANUFACTURER'S NAME AND ADDRESS		MANUFACTURING QUALITY PLAN				PROJECT :							
			ITEM :		QP NO.: REV. NO.: DATE: PAGE: OF....		PACKAGE : CONTRACT NO. : MAIN-SUPPLIER:							
SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
					M	C / B					M	C	B	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	**	10.		11.

		LEGEND: * RECORDS, IDENTIFIED WITH "TICK" (✓) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. ** M: MANUFACTURER/SUB-SUPPLIER C: MAIN SUPPLIER, B: WBPDC P: PERFORM W: WITNESS AND V: VERIFICATION, AS APPROPRIATE, CHP: WBPDC SHALL IDENTIFY IN COLUMN "B" AS 'W'	 FOR WBPDC USE	DOC. NO.:		REV..... CAT.....	
MANUFACTURER/ SUB-SUPPLIER				MAIN-SUPPLIER			
SIGNATURE					REVIEWED BY	APPROVED BY	APPROVAL SEAL



ANNEXURE#11
of
TECHNICAL ENQUIRY SPECIFICATION
for
Coal Handling Plant Conveyor System

for
SAGARDIGHI THERMAL POWER PROJECT
1 x 660 MW UNIT NO. 5, PHASE – III
WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED

Content:

SCOPE MATRIX (MECHANICAL & CIVIL)

General Scope Matrix for Conveyor Package of CHP- 1X660 MW WBPDCS SAGARDIGHI PROJECT (Conveyor Package bidder & BHEL civil/other vendor) Rev-00 Date: 03-06-19

Sl. No.		JOB & Area	Responsibility				
			Design & Drawing	Supply	Storage & Handling	Supervision & Checking	Fixing, Erection, Testing & Commissioning, PG Test & Handing Over
1	A	All types of pulleys, idlers, pulley frames, idler brackets etc. for all conveyors, belt feeders, reversible belt feeders, all stringer, short post, making hole in runner channel in conveyor gallery, all support structure for conveyors.	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
	B	Civil foundation work for pulley frames.*	BHEL	BHEL- Civil Contractor	BHEL- Civil Contractor	BHEL- Civil Contractor & Conveyor Package Bidder	BHEL- Civil Contractor
	C	All equipment foundation bolts, nuts, bolts, stools & any other fixing accessories for the items under sl. No. 1.	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
2	A	All chutes & surge bins, including interconnecting chute, discharge & receiving chutes for Apron feeder, roller screen feeder and crusher including expansion bellows, tramp chute for ILMS, travelling tripper discharge chutes, debris chutes and bins etc. and support from the main structure of all items mentioned in S.No.2 at all TPs (19 to 28), CRH, bunker house for complete CHP	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
	B	Floor cleaning chute at all TPs, CRH, Galleries for complete CHP	BHEL	BHEL- Civil Contractor	BHEL- Civil Contractor	BHEL- Civil Contractor	BHEL- Civil Contractor
3	A	All Hydraulic drive for conveyors including electrical motors (LT & HT).	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
	B	All foundation bolts, nuts, bolts & any other fixing accessories for the items under sl. No. 3	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
4	A	Gear box for all belt feeder, reversible belt feeder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
	B	All foundation bolts, nuts, bolts, , base frames & any other fixing accessories for the items under sl. No. 4	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
5	A	High speed & low speed coupling for conveyor drive, belt feeder drive, reversible belt feeder drive	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
	B	All foundation bolts, nuts, bolts, , base frames & any other fixing accessories for the items under sl. No. 5	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
6		Conveyor belting (including belting for belt feeder & reversible belt feeder, bunker sealing belt) and vulcanizing at site	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
7		Belt scraper (external & internal)	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
8		Skirt board assembly including sealing arrangement for all conveyors, belt feeders, reversible belt feeders including structures, fixing accessories	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
9		Deck plate for all conveyors, belt feeders, reversible belt feeders	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
10		Take up arrangement for belt feeder & reversible belt feeder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
11		Chute block switch and chute vibrator for all chutes	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
12		Flap Gate, Flow Divider including pneumatic actuator for all chutes (wherever applicable as per coal flow diagram)	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
13		Travelling trippers complete with structures, mechanical equipments, rails, rail fixtures, clamps, wheel & axle, bearings, tripper drive equipments, energy chain, flapgate with motorized actuator etc. complete with electrical as per spec.	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
14		Inline Magnetic separators (ILMS) complete with all electrics, instrumentation including control panels	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
15		Metal detectors complete with all mechanical, electrics, instrumentation including control panels	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
16		Suspended Magnet complete with all mechanical, electrics, instrumentation including control panels	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder

General Scope Matrix for Conveyor Package of CHP- 1X660 MW WBPDCS SAGARDIGHI PROJECT (Conveyor Package bidder & BHEL civil/other vendor) Rev-00 Date: 03-06-19

Sl. No.	JOB & Area	Responsibility				
		Design & Drawing	Supply	Storage & Handling	Supervision & Checking	Fixing, Erection, Testing & Commissioning, PG Test & Handing Over
17	Coal sampling units complete with all mechanical, electrics, instrumentation including control panels, structural support, ladder, platform, handrail	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
18	Rod gate	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
19	R & P gate complete with actuator, drive motors, electrics etc	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
20	Belt weigher complete with all mechanical, electrics, instrumentation including control panels	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
21	Electric hoists with complete hoist as per spec	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
22	Manual hoists, chain pulley blocks etc.	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
23	Elevators complete with structures, guides, mechanical equipments, all drives, electrics, instrumentation including control panels	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
24	Civil works of Elevator*	BHEL	BHEL- Civil Contractor	BHEL- Civil Contractor	BHEL- Civil Contractor	BHEL- Civil Contractor
25	Ring granulator Crusher	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
26	HT Motor for Crusher	BHEL	BHEL	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
27	Scoop type Fluid coupling & geared coupling for Crusher	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
28	Vibration isolation system for Crusher	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
29	RCC top deck for Crusher & drives	Conveyor Package Bidder	BHEL- Civil Contractor	BHEL- Civil Contractor	BHEL- Civil Contractor & Conveyor Package Bidder	BHEL- Civil Contractor
30	Roller screen/feeders with drive equipments	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
31	Base frame, stools, foundation bolts & nuts (for fixing frame & equipments over frame) for Roller screen/feeder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
32	Insert plates for all equipments under scope of supply of conveyor package Bidder*	BHEL	BHEL Civil & Str contractor	BHEL Civil & Str contractor	Conveyor Package Bidder & BHEL Civil & Str contractor	BHEL Civil & Str contractor
33	Foundation bolts for all equipment supplied by Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
34	Monorails for Hoists for complete CHP (except Bunker House) *	BHEL	BHEL Civil & Str contractor	BHEL Civil & Str contractor	BHEL Civil & Str contractor	BHEL Civil & Str contractor
35	Monorails for Hoists for Bunker Floor	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
36	Ladders, Maintenance platform & Stools for inspection of skirt, poke holes, Inspection door for the chutes, RPG, ROD gates, Hoist, CSU, Crusher, Screen and other equipment as required.	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
37	Conveyor cross-over, structural supports, ladder, maintenance platform	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
38	Hand rails in galleries, Transfer towers, Crusher house	BHEL	BHEL Civil & Str contractor	BHEL Civil & Str contractor	BHEL Civil & Str contractor	BHEL Civil & Str contractor
39	Hand rails for equipments	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
40	Wire mesh Guards/ safety guard for Equipments under bidder's scope	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
41	Bend Pulley Frames for Take-up unit	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
42	Vertical Gravity Take up (VGTU) unit with counterweight, guide post, foundation bolts, spring/stool support, take pulley with supporting frame, rope, chain pulley block(CPB), hook for fixing CPB, any other items to complete VGTU except structural items as mentioned in Sl. no. 46	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
43	VGTU Structure with staircase/ladder, platform, hand rail, partition, fencing (part of gallery)*	BHEL	BHEL Civil & Str contractor	BHEL Civil & Str contractor	BHEL Civil & Str contractor	BHEL Civil & Str contractor
44	Horizontal Gravity Take up (HGTU) unit complete including structures with platform, ladder, handrail along with foundation bolts, sleeves etc.	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder

General Scope Matrix for Conveyor Package of CHP- 1X660 MW WBPDCS SAGARDIGHI PROJECT (Conveyor Package bidder & BHEL civil/other vendor) Rev-00 Date: 03-06-19

Sl. No.		JOB & Area	Responsibility				
			Design & Drawing	Supply	Storage & Handling	Supervision & Checking	Fixing, Erection, Testing & Commissioning, PG Test & Handing Over
45		VG TU/HGTU foundation*	BHEL	BHEL Civil & Str contractor	BHEL Civil & Str contractor	Conveyor Package Bidder & BHEL Civil & Str contractor	BHEL Civil & Str contractor
46		Counter weight for VG TU & HGTU	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
47		ILMS fixing lugs	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
48		Gratings for bunker slots and for sump pits	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
49		Seal Plates in conveyor gallery	BHEL	BHEL Civil & Str contractor	BHEL Civil & Str contractor	BHEL Civil & Str contractor	BHEL Civil & Str contractor
50		Grouting with supply of Non Shrink expandable grade for mechanical equipments for Conveyor Package	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
51		Rain water pipe	BHEL	BHEL Civil & Str contractor	BHEL Civil & Str contractor	BHEL Civil & Str contractor	BHEL Civil & Str contractor
52		Runners below conveyor short post in gallery (without holes)	BHEL	BHEL Civil & Str contractor	BHEL Civil & Str contractor	BHEL Civil & Str contractor	BHEL Civil & Str contractor
53		DE System with related structures & supports	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
54		DS, DFDS, Service Water, Potable Water, Make-up Water System	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
55		Sump Pump with piping system for CHP area upto coal settling pond	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
56		Ventilation System for CHP MCCs, Toilets, CHP Pump House, Dozer shed as per Technical specification.	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
57		Air conditioning system including electrical for building as per Technical specification.	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
58		Foundation and civil work for DE system, DS, Water System, ventilation & air-conditioning *	BHEL	BHEL Civil & Str contractor	BHEL Civil & Str contractor	BHEL Civil & Str contractor	BHEL Civil & Str contractor
59		Supply of Tools & Tackles, Lubricants, Mandatory Spares, recommended spares, E&C Spares, other consumables	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder
60		Any other items required to complete the conveyor system as per specification	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder	Conveyor Package Bidder

- NOTE:**
- 1 This is general scope matrix, However for detailed scope of supply & works refer technical enquiry specification. For electrical scope matrix refer electrical specification attached in annexure.
 - 2 * Civil inputs shall be furnished by bidder to BHEL.
 - 3 The above mentioned list is not exhaustive, For scope of items/equipments which are not mentioned above shall be as per the Technical & customer specification.



ANNEXURE#12
of
TECHNICAL ENQUIRY SPECIFICATION
for
Coal Handling Plant Conveyor System

for

SAGARDIGHI THERMAL POWER PROJECT
1 x 660 MW UNIT NO. 5, PHASE – III
WEST BENGAL POWER DEVELOPMENT CORPORATION LIMITED

Content:

STORAGE & PACKING INSTRUCTION

SITE STORAGE AND PRESERVATION GUIDELINES

FOR

MECHNANICAL BOPs

(Doc No: PE-DC-SSG-A001 REV.00)



PROJECT ENGINEERING MANAGEMENT, POWER SECTOR
BHARAT HEAVY ELECTRICALS LIMITED-NOIDA

CONTENT

- 1 SCOPE OF THE DOCUMENT
- 2 PURPOSE OF STORAGE & PRESERVATION
- 3 MEASURES TO BE TAKEN FOR STORAGE AND PRESERVATION
 - a) GENERAL STORAGE REQUIREMENTS
 - b) GENERAL PRESERVATION REQUIREMENTS
 - c) GENERAL INSPECTION REQUIREMENTS
- 4 TYPE OF STORAGE FOR VARIOUS EQUIPMENT
5. CONCLUSION
6. STACKING ARRANGEMENT FOR PLATES AND STRUCTURAL STEEL

1. SCOPE OF THE DOCUMENT

This guideline is prepared in intent to provide proper site storage and preservation of the Mechanical, Electrical and C & I items / equipment supplied under various bought out packages/items. This storage procedure shall be followed at different power plant sites by concerned agency for storage and preservation from the date of equipment received at site until the same are erected and handed over to the customer.

2. PURPOSE OF STORAGE & PRESERVATION

Many of the items may be required to be kept in stores for long period. It shall therefore be essential that proper methods of storage and preservation be applied so that items do not deteriorate, loose some of their properties and become unusable due to atmospheric conditions and biological elements.

3. MEASURES TO BE TAKEN FOR STORAGE, HANDLING & PRESERVATION

a) GENERAL STORAGE REQUIREMENTS

1. To the extent feasible, materials should be stored near the point of erection. The storage areas should have adequate unloading and handling facilities with adequate passage space for movement of material handling equipment such as cranes, fork lift trucks, etc. The storage of materials shall be properly planned to minimise time loss during retrieval of items required for erection.
2. The outdoor storage areas as well as semi-closed stores shall be provided with adequate drainage facilities to prevent water logging. Adequacy of these facilities shall be checked prior to monsoon.
3. The storage sheds shall be built in conformity with fire safety requirements. The stores shall be provided with adequate lights and fire extinguishers. 'No smoking' signs shall be placed at strategic locations. Safety precautions shall be strictly enforced.
4. Adequate lighting facility shall be provided in storage areas and storage sheds and security personnel positioned to ensure enforcement of security measures to prevent theft and loss of materials.
5. Adequate number of competent stores personnel and security staff shall be deployed to efficiently store and maintain the equipment / material.
7. The equipment shall be stored in an orderly manner, preserving their identification slips, tags and instruction booklets, etc., required during erection. The storage of materials shall be equipment-wise. Loose parts shall be stored in sheds on racks,

preserving the identification marks and tags in good condition. The group codes shall be displayed on the racks

6. At no time shall any materials be stored directly on ground. All materials shall be stored minimum 200 mm above the ground preferably on wooden sleepers

b) GENERAL PRESERVATION REQUIREMENTS

1. All special measures to prevent corrosion shall be taken like keeping material in dry condition, avoiding the equipment coming in contact with corrosive fluid like water, acid etc.
2. Materials which carry protective coating shall not be wrapped in paper, cloth, etc., as these are liable to absorb and retain moisture. The material shall be inspected and in case of signs of wear or damages to protective coating, that portion shall be cleaned with approved solution and coated with an approved protective paint. Complete record of all such observations and protective measures taken shall be maintained.
3. Generally equipment supplied at site are properly greased or rust protective oil is applied on machined/ fabricated components. However periodic inspection shall be carried out to ensure that protection offered is intact.
4. While handling the equipment, no dragging on the ground is permitted. Avoid using wire rope for lifting coated components. Use polyester slings (if possible) otherwise protective material (e.g. clothes, wood block etc.) should be used while handling the components with rope / slings
5. For Equipment supplied with finished paint, touch paint shall be done in case any surface paint gets peeled off during handling. Otherwise such surfaces shall necessarily be wrapped with polythene to avoid any corrosion. Further for equipment wherein finish coat is to be applied at site, site to ensure that equipment is received with primer coat applied.
6. It shall be ensured by periodic inspection that plastic inserts are intact in tapped holes, wherever applicable.
7. Pipes shall be blown with air periodically and it shall be ensured that there is no obstruction.
8. Silica gel or approved equivalent moisture absorbing material in small cotton bags shall be placed and tied at various points on the equipment, wherever necessary.
9. Heavy rotating parts in assembled conditions shall be periodically rotated to prevent corrosion/jamming due to prolonged storage.

10. All the electrical equipment such as motors, generators, etc. shall be tested for insulation resistance at least once in three months and a record of such measured insulation values shall be maintained.
11. Following preservatives/preservation methods can be used depending upon type of equipment
 - a. Rust preventive fluid (RPF)
 - b. Rust protective paints
 - c. Tarpaulin covers, in case of outdoor storage
 - d. De-oxy aluminate for weld-ments

c) GENERAL INSPECTION REQUIREMENTS

1. Period inspection of materials with specific reference to –
 - Ingress of moisture and corrosion damages.
 - Damage to protective coating.
 - Open ends in pipes, vessels and equipment -
 - In case any open ends are noticed, same shall be capped.
2. Any damages to equipment / materials.
 - In case of any damages, these shall be promptly notified and in all cases, the repairs / rectification shall be carried out.
 - Any items found damaged or not suitable as per project requirements shall be removed from site. If required to store temporarily, they shall be clearly marked and stored separately to prevent any inadvertent use.

4. TYPE OF STORAGE FOR VARIOUS EQUIPMENT

The types of storage are broadly classified under the following heads:

i **Closed storage with dry and dust free atmosphere. (C)**

The closed shed can be constructed by using cold-rolled / tubular components for structure and corrugated asbestos sheets / galvanised iron sheets for roofing. Brick walls / asbestos sheets can be used to cover all the sides. The floor of the shed can be finished with plain cement concrete suitably glazed. The shed shall be provided with proper ventilation and illumination.



ii **Semi-closed storage. (S)**

The semi closed shed can be constructed by using cold-rolled / tubular components for structure and corrugated / asbestos sheets for roofing. The floor shall be brick paved. If required a small portion of sides can be covered to protect components from rainwater splashing onto the components.





iii Open storage (O)

The open yard shall be levelled, well consolidated to achieve raised ground with the provision of feeder roads for crane approach along with access roads running all sides. One part of the open yard shall be stone pitched, levelled and consolidated with raised ground suitable for storing / stacking heavier and critical components with due space to handle them by cranes etc . Adequate number of sleepers, concrete block etc. to be provided to make raised platforms to stack critical materials.

A separate yard to be identified as “scrap yard” slightly away from main open yard to store wooden/steel scraps, which are to be disposed off. This is required to avoid mix up with regular components as well as to avoid fire hazard.

Some of the components, which are having both machined & un-machined surfaces and are bulky, shall be stored in open storage area on a raised ground and suitably covered with water proof / fire retardant tarpaulin.



The equipment listed below shall be stored and inspected as per requirement mentioned in the table below.

Sl. No.	Description of the equipment	Type of Storage	Check for	Remarks
Raw material /mechanical items like pipes, plates, structure sections etc.)				
1.	Steel pipes (lined/unlined)	S	Damage , paint, corrosion, rubber lining peeling	Provide end cap
2.	MS Plates	S	Damage, paint, corrosion	
3.	SS Plates	S	Damage	
4.	Non-metallic pipes	S	Damage, cracks	Provide end cap
5.	Stainless steel pipes	S	Damage ,	Provide end cap
6.	MS sections, beams	S	Damage, paint, corrosion	
7.	Cable trays	S	Damage, condition of preservations	
8.	Insulation sheets	S	Damage	
9.	Insulation	C	Damage, packing	
10.	Hangers Rods	S	Damage, paint, packing	
11.	Tubes	S	Damage, paint , packing	Provide end cap
12.	Hume pipes	O	Damage	
13.	Castings	O	Damage, paint, corrosion	
Fabricated mechanical items (pressure vessels, tanks etc.)				
14.	Pressure vessels (unlined)	O	Damage, paint, corrosion,	Covered nozzles
15.	Atmospheric storage tanks (unlined)	O	Damage, paint, corrosion	Covered nozzles

Sl. No.	Description of the equipment	Type of Storage	Check for	Remarks
16.	Pressure vessels (lined)	S	Damage, paint, corrosion, rubber lining	
17.	Atmospheric storage tanks(lined)	S	Damage, paint, corrosion, rubber lining	
18.	Support structures	O	Damage , paint, corrosion	
19.	Flanges	C	Damage , paint, corrosion	
20.	Fabricated pipes	S	Damage , paint, corrosion	Provide end cap
21.	Vessels internals	C	Damage , paint, corrosion ,packing	
22.	Grills	S	Damage , paint, corrosion	
23.	Angles	S	Damage , paint, corrosion	
24.	Bridge mechanism/clarifier mechanism	O	Damage , paint, corrosion	
25.	Cranes, rails	S	Damage , paint, corrosion	
26.	Stair cases	O	Damage , paint, corrosion	
27.	Ladders/handrails	O	Damage , paint, corrosion	
28.	Fabricated ducts	S	Damage , paint, corrosion	
29.	Isolation Gates	O	Damage , paint, corrosion	
30.	Fabricated boxes/panels	S	Damage , paint, corrosion	
Mechanical components like valves, fittings, cables glands, spares etc.)				
31.	Valves	S	Damage , packing	

Sl. No.	Description of the equipment	Type of Storage	Check for	Remarks
32.	Fittings	S	Damage , packing	Provide end cap
33.	Cable glands	C	Damage , packing	
34.	Tools & tackles	C	Damage , packing	
35.	Nut , bolts, washers,	C	Damage , packing	
36.	Gasket & Packings	C	Damage , packing	
37.	Copper tubes	C	Damage , packing, corrosion	Provide end cap
38.	SS tubing	C	Damage , packing	Provide end cap
Rotating assemblies (pumps, blowers, stirrers, fans, compressors etc.)				
39.	Pumps	S	Damage , packing, corrosion	Shaft rotation
40.	Blowers/Compressors	S	Damage , packing, corrosion	Shaft rotation
41.	Agitators/stirrers/radial launders	C	Damage , packing, corrosion	Shaft rotation
42.	Rollers for chlorine tonner mounting	C	Damage , packing, corrosion	
43.	Centrifuge	S	Damage , packing,	
44.	Gear box	C	Damage , packing, corrosion	
45.	Bearings	C	Damage , packing, corrosion	
46.	Fans	S	Damage , packing, corrosion	
47.	Dosing skids	S	Damage , packing, corrosion	
48.	Pump assemblies	S	Damage , packing, corrosion	
49.	Air washers(INTERNALS)	S	Damage , packing	
50.	Air conditioners (split)	C	Damage , packing	

Sl. No.	Description of the equipment	Type of Storage	Check for	Remarks
51.	Elevators(CONTAINERIZED)	O	Damage , packing, corrosion	
52.	Chillers/VA machines	S	Damage , packing	
53.	Air handling Unit/Package unit	S	Damage , packing	
54.	Chlorinators & Evaporators	C	Damage , packing	
55.	Ejectors	C	Damage , packing	
56.	Electrolyser	C	Damage , packing	
Miscellaneous items like chain pulley blocks, hoists etc.				
57.	Chain pulley blocks	S	Damage, Packing	
58.	Electric hoists	S	Damage, Packing	
59.	Fire extinguishers	C	Damage, expiry date	
60.	Fork Lift Truck	S	Damage, Packing	
61.	Hydraulic Mobile Crane	O	Damage, Packing	
62.	Mobile Pick Up & Carry Crane	O	Damage, Packing	
63.	Motor boats	O	Damage, Packing	
64.	Safety showers	S	Damage, Packing	
65.	Diffusers/dampers	S	Damage, Packing	
Chemicals and consumables (acid, alkali, paints, oils, reagents and special chemicals)				
66.	Hydro Chloric Acid (HCl)	Store in canes/ storage tank in dyke area	Date of production/ leakage/fumes	hazardous chemical
67.	Sulphuric acid (H ₂ SO ₄)	Store in canes/ storage tank in dyke area	Date of production/ leakage/fumes	hazardous chemical

Sl. No.	Description of the equipment	Type of Storage	Check for	Remarks
68.	Sodium hydroxide (NaOH)	Store in canes/ storage tank in dyke area	Date of production/ leakage/ fumes/ breather	hazardous chemical ,breather to be checked for air ingress
69.	Sodium hypo chlorite	To be stored under shed	Date of production/ leakage/ fumes	hazardous chemical ,self-life normally 15-30 days after which strength of chemical decays
70.	Ammonia	S	Date of production/ leakage/ fumes	Store in closed storage tanks, hazardous chemical
71.	CW treatment chemicals	S	Date of production , Self-life	Store in closed canes
72.	RO/UF cleaning chemicals	S	Date of production , Self-life	Store in closed canes
73.	Lime	C	Damage to packing , seepage	Prevent moisture, rain
74.	Alum bricks	C	Damage to packing	Prevent moisture, rain
75.	Poly electrolyte	S		Store in closed storage tanks
76.	Laboratory chemicals(powder)	C	Damage, Packing self-life	
77.	Laboratory chemicals(liquid)	C	Damage, Packing self-life	
78.	Lubrication oils	C	Leakage	
79.	Paints	S	Leakage ,air tightness	
80.	Sand	O	Damage of packing	No hooks
81.	Salt (NaCl)	C	Damage of packing, water ingress	Prevent moisture, rain
82.	Anthracite	S	Damage of packing	
83.	Activated carbon	S	Damage of packing	

Sl. No.	Description of the equipment	Type of Storage	Check for	Remarks
84.	Thermal insulation	S	Damage of packing	
85.	Cement	C	Damage of packing	Prevent moisture, rain
86.	Gravels	O	Damage of packing	
87.	ION exchange resins	C	Damage , packing	Refer manufacturer guidelines
88.	RO membranes	C	Damage , packing	Refer manufacturer guidelines
89.	UF membranes	C	Damage , packing	Refer manufacturer guidelines
90.	Cleaning chemicals	C	Damage , packing	Refer manufacturer guidelines
91.	Chemicals for analysers/calibration	C	Damage , packing	Refer manufacturer guidelines
Electrical and C & I items (motors, cables etc.)				
92.	Motors	C	Damage , packing	
93.	Cable drums	O	Damage	
94.	Control Panel /control desk, UPS ,JB	S	Damage, Packing	
95.	Instruments(gauges/analysers)	C	Damage	
Special items		As per Manufacturer's item, like Hydrogen cylinders, Ozonator, Analyser, Chlorine dioxide generators etc.		

5. CONCLUSION

Concerned storage agency at site should make sure that loss in equipment performance and wear & tear are minimised through proper storage and preservation. The above are broad guidelines and cover major equipment / materials. However specific storage practices shall be followed as per manufacturer recommendation. All the necessary measures even in addition to the ones mentioned above, if found necessary, should be taken to achieve the objective.

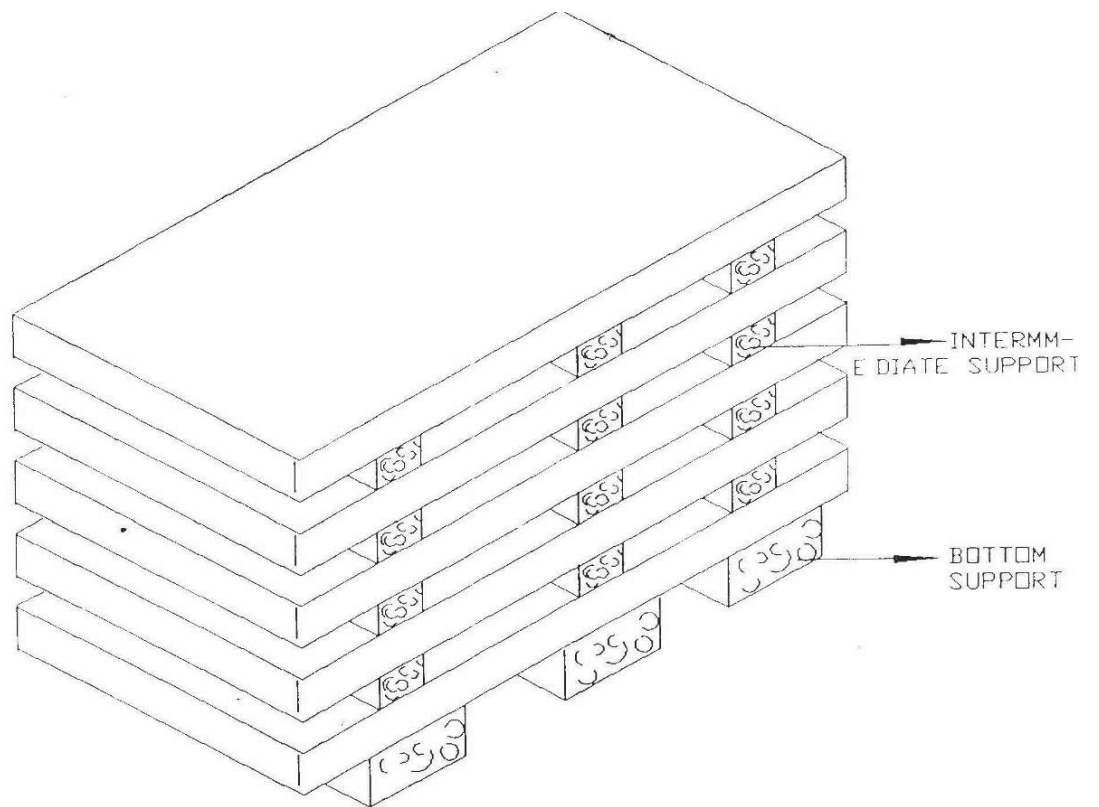


Figure – 1 – PLATE STACKING ARRANGEMENT

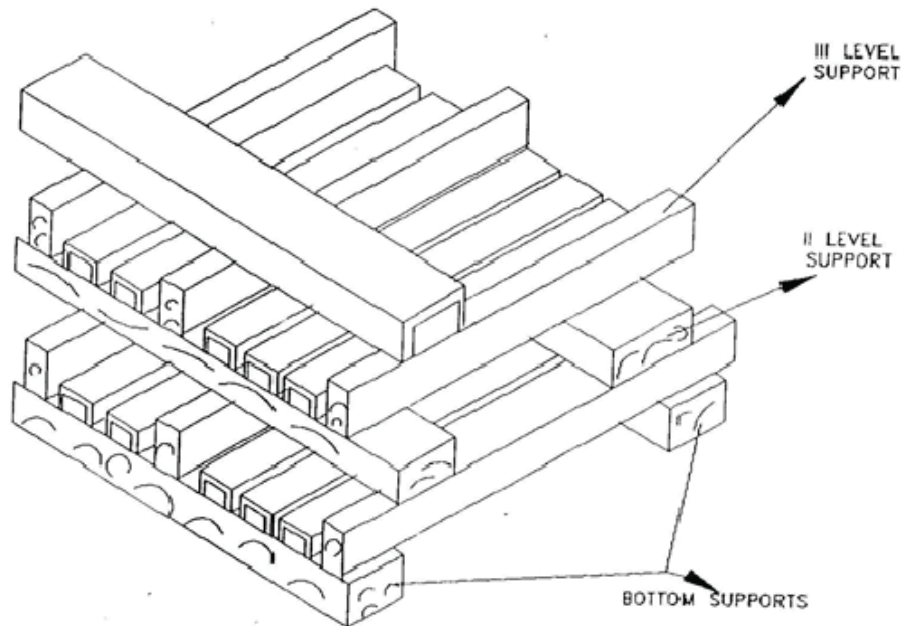


Figure – 2 – STRUCTURAL STEEL STACKING ARRANGEMENT