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**PROJECT REPORT
FOR
SAKHARI-IRAWATI (PAUNI-III) OC MINE
(BALLARPUR AREA)**

WESTERN COALFIELDS LTD.

(JOB No. 4021291)

**VOLUME-II
(TEXT, APPENDICES & ANNEXURES)**



MARCH- 2009

CMPDI

**REGIONAL INSTITUTE-IV, KASTRUBA NAGAR,
JARIPATKA, NAGPUR, PIN - 440 014**

AN ISO 9001:2000 COMPANY

T. NO.: C I /8656

11.4.5 Allied Structures:

Provision for hardstand below the truck loading hoppers is included in the cost estimate. The estimate also includes a sump of 35 cum. capacity with a pump house over it for dust suppression arrangements, a CHP office and a substation building with an open yard for transformer, which is provided with barbed wire fencing. General land development of the entire CHP area, soil investigations and provisions for foundations in poor soil etc. has all been kept in the cost estimate.

11.5.0 CAPITAL REQUIREMENTS AND OPERATING COST:

The total capital requirement for provision made in this report (as on March, 2009) works out to Rs. 1018.40 lakhs. The details are given in Appendix – A.3.5. The operating cost of the CHP is estimated as Rs. 29.53/ t. of coal.

The details of manpower as per the provision of the Project Report is given in Appendix – B.

The estimates of Plant & Machinery are based on 'Standard Price List of Mining Machinery', November, 2007 (**escalated to March, 2009**) circulated by CMPDI (HQ), and the latest supply order of the equipment. The civil & structural costs are based on cost index 360 (in 1st half of 2009) with reference 100 base at Nagpur as on 1.1.92.

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Chapter - XI

COAL HANDLING AND DESPATCH ARRANGEMENT

11.1 Introduction

A small coal handling plant has been proposed to handle the entire production of coal from Sakhari-Irawati (Pauni-III) OCP.

11.2 Design Parameters11.2.1 Basic Data

- | | | |
|----|-----------------------------|-------------------------------------|
| a) | Target production from mine | - 1.25 Mty. |
| b) | Mine Operation | - 3 Shifts/Day |
| c) | CHP Operation | - 3 Shifts/Day |
| d) | Life of the mine | - 21 Years |
| e) | Size of coal (ROM) | - (-) 200 mm |
| f) | Grade of coal | - Grade E |
| g) | Mode of Despatch | - By road |
| h) | Customer | - M.S.E.B. and other misc. consumer |

11.2.2 CHP Working Schedule

CHP will work for 330 days in a year. There will be 3 shifts in a day. It will work 5 hours per shift.

11.2.3 System Capacity of CHP

System capacity of CHP is around 400 tph.

11.2.4 Salient Features of CHP

The salient features of CHP are as follows:

- a) Feeder breaker for crushing of coal to (-) 200 mm size
- b) Conveying of coal by 1200 mm wide belt conveyor
- c) Storage of coal in a 2 x 100 t capacity overhead twin hopper
- d) Despatch of coal on road by trucks
- e) Dust suppression and fire extinguisher system
- f) Power supply, illumination and control systems
- g) Civil and structural cost
- h) Weighment of coal with the help of road weighbridges

11.2.5 System Description

Rear discharge dumpers of 60T capacity or equivalent type / tipping trucks will carry coal from mine and discharge onto a fixed inclined plate installed before the hopper of the feeder breaker.

There will be two streams. Each stream consists of one feeder breaker, one conveyor and a 2 x 100 t capacity overhead twin hopper. Out of two streams, only one stream will work at a time.

The feeder breaker will be used to crush coal to (-)200 mm size which is conveyable. A conveyor C1 of 1200mm wide will be installed below the feeder breaker. The conveyor C1 will be used to receive the crushed coal from feeder breaker. Coal dust and muck below feeder breaker will also be collected on the same conveyor C1. Coal collected by conveyor C1 will be discharged into overhead twin hoppers of 2 x 100 t capacity.

The second feeder breaker will also be used to crush coal to (-)200 mm size which is conveyable. Another conveyor C2 of 1200mm wide will be installed below the second feeder breaker. The conveyor C2 will be used to receive the crushed coal from feeder breaker. Coal dust and muck below feeder breaker will also be collected on the same conveyor C2. Coal collected by conveyor C2 will be discharged into overhead twin hoppers of 2 x 100 t capacity.

Trucks will be loaded from below these overhead hoppers with the help of reciprocating feeders provided at the bottom openings of the hoppers.

Two nos. of electronic road weighbridges of 100t capacity each will be used for weighing of empty and loaded trucks and for preparation of bills.

In case there is no off-take and the hoppers are full, coal from processed ROM hoppers will be dumped by trucks at a suitable location on ground. These heaps will be liquidated at a later date, as and when possible, by using front-end loaders / pay loaders, available in the project.

11.2.6 System Description

11.2.6.1 Coal Receipt Section and crushing Section

Rear discharge dumpers of 60T capacity or equivalent type / tipping trucks will carry coal from mine and discharge onto fixed inclined plates installed before the hoppers of the feeder breakers. Out of two feeder breakers one feeder breaker will be working and the second feeder will be used as stand by.

11.2.6.2 Conveyor

A conveyor C1 of 1200 mm wide will be provided below feeder breaker to receive crushed coal from feeder breaker, dust and muck from below feeder breaker. Conveyor C1 will discharge coal into a 2 x 100 t. capacity overhead twin hopper.

Another conveyor C2 of 1200 mm wide will be provided below the second feeder breaker to receive crushed coal from feeder breaker, dust and muck from below feeder breaker. Conveyor C2 will discharge coal into another 2 x 100 t. capacity overhead twin hopper.

Out of two conveyors C1 and C2, only one conveyor will work at a time.

11.2.6.3 Storage

Two nos of 2 x 100 t capacity overhead twin hopper will be provided for storage of processed ROM coal.

All the coal hoppers will be 6m x 6m size. The slope of hopper faces will be 55 deg with horizontal. Abrasion resistant tiscral / equivalent liners of minimum 10 mm thickness will be fixed to the base plate by means of plug welding.

11.2.6.4 Truck Loading

Trucks will be loaded below the overhead hoppers. For this purpose, reciprocating feeders of 200 t capacity each will be provided at the discharge openings of the hoppers.

11.2.6.5 Weighment

The trucks will be weighed with the help of two nos. 100t. capacity electronic road weighbridges, each of 100t. capacity, before and after loading to assess the correct quantity of coal being despatched and for preparation of despatch statements and bills.

11.2.6.6 Dust Suppression System

Coal dust will be created at all transfer points where there is a fall of coal. The dust, if escapes into atmosphere, creates environmental pollution. Environmental pollution can be reduced by suppressing dust at the point of dust generation. Water will be sprayed under relatively high pressure in atomized condition through nozzles at various dust generating points. Fixed type water sprinklers will also be provided for suppression of dust for vehicular movement etc.

11.2.6.7 Fire extinguisher System

Dry powder type fire extinguishers and sand buckets will be provided near drive pulleys of conveyors C1, C2, sub-station building, CHP office etc. for immediate action on electrical fire.

11.2.6.8 Plant Cleaning System

Three nos. of general mazdoors will be provided, one in each shift, for cleaning of coal handling plant.

11.2.6.9 Plant Maintenance System:

Proper maintenance of the plant is necessary for smooth operation of the plant. For this purpose, two nos. of mechanical fitters, three nos. of electrical fitters and one no. of welder have been provided.

11.3 POWER SUPPLY, ILLUMINATION AND CONTROL:

11.3.1 Source of Power and Supply Voltage:

Normal total connected load of this CHP has been estimated at 350 kW. Transformer capacity has been provided so that both the feeder breakers will run simultaneously whenever required. The proposed substation shall receive power at 3.3 kV from the project main substation.. An independent substation, located at a suitable location near the feeder breaker house, will supply power to the various equipment operating in the CHP.

11.3.2 Power Distribution Scheme:

The various outdoor installation in the substation will be as follows:

- 1) 3.3 kV, 400A, 150 MVA VCB for primary control of transformer.
- 2) Power transformer 1000kVA, 3.3 kV/415 V outdoor type.

To feed power to different CHP equipment a 17 panel motor control centre has been proposed.

11.3.3 Motor Control Centre:

The MCC shall have 17 Nos. of panels, suitable for 440 V, 3 Ph system. The various major equipment / electrical load receiving power from MCC are as follows:

- 1) Feeder Breakers – 2 Nos.
- 2) Conveyor C1
- 3) Conveyor C2
- 4) Reciprocating feeders – 4 Nos.
- 5) Dust suppression pump

Ammeter with selector switches will be provided in all the panels of the power distribution board. Voltmeter, ammeter with selector switches and energy meter shall be provided in the incomer panel.

11.3.4 Protections:

The incomer ACB panel in the MCC will be provided with short circuit (S/C) over current (O/C) and earth fault (E/F) protections. All other ACB's in the MCC will be provided with O/C and E/F protections. All the D.O.L. starters in the M.C.C. will have protective gears for overload and single phasing prevention. Fuse switch units of required rating will be provided as a protection against short circuit.

11.3.5 Reactive power compensation:

Capacitor bank of total capacity 375 KVAR incorporating 5 banks each of capacity 75kVAR will be provided to achieve the overall power factor of the CHP as 0.96 lagging.

11.3.6 Illumination scheme:

11.3.6.1 Lighting distribution board:

One 11-panel lighting distribution board has been provided controlled by 200A, MCCB. Each panel shall be having 20A D.P. MCB for control of various lighting circuits.

11.3.6.2 Luminaires:

Illumination of conveyor gantries, drive houses, transfer houses, areas surrounding feeder breaker, platforms below the loading hoppers will be done with the help of industrial type well glass, 125 W HPMV lamps having integral control gear & 2 x 40 W, industrial dust & jet proof fluorescent lamps. The indoor of the substation building, CHP office, pump house will be illuminated with the help of 2 x 40 W industrial type fluorescent lamps. High-pressure sodium vapour lamps of 250 W will be used for outdoor yard lighting. For this purpose four numbers of 12 m high lighting towers, each fitted with four Nos. 250 W HPSV lamp fittings will be provided. Provision of 250 W HPSV luminaries have been kept for miscellaneous outdoor installations (as stated above). These fittings will be fitted over the structures of substation building, transfer / drive houses, conveyor gantry etc. as per requirement of outdoor lighting.

11.3.7 Earthing:

The plant earthing will be in accordance with IS: 3043, IS: 737 and as per IE rules in vogue. The number of earth pits will depend on the actual soil resistivity of the plant area. Pipe electrode type earthing has been adopted. The transformer neutral will have two separate and distinct connections to the earth.

11.3.8 Interlocking of starters for sequence operation:

Each drive will have facility to be controlled manually by the respective starters in the motor control centre. Starters of various drives in the motor control centre will be interlocked in such a way that they can be operated in a definite sequence. However, for repair and maintenance and inspection work, interlock defeat switches will be provided.

11.4.0 CIVIL AND STRUCTURAL WORKS:

11.4.1 Retaining Wall:

A RCC retaining wall of height 6m from G.L. and length 24m suitable for discharging coal by LW-60t. rear discharge dumpers to accommodate two feeder breakers is conceived. The retaining wall shall have a pair of wing wall of length 9m and the backfilling returned with proper slope.

11.4.2 Feeder breaker supporting structures:

The cost of providing structural steel supports for supporting the feeder breaker is included in the estimate.

11.4.3 Conveyor structures & drive house of conveyor C1 & C2:

The conveyor C1 & C2 is supported on the ground over PCC pedestals and this portion is covered with roof by an arrangement of column and truss. Above ground the conveyor is supported on standard gantries, which are in turn supported on standard trestles. The trestles are both up to 10m ht. and above 10m ht. also.

The conveyor C1 & C2 supported by gantries is supported at the other end on a truck loading house. An intermediate drive house is located near the ground conveyor portion for locating the drive head of the conveyor C1 & C2.

11.4.4 Truck Loading House:

The conveyor C1 & C2 discharge coal to the truck loading houses. Each house consists of two different floors at various levels. The floor at the top supports in addition to the gantry for conveyor C1 & C2, the discharge drum also. The second platform is located below the 2 x 100t. capacity ROM coal hopper, which supports the reciprocating feeders for truck loading. The entire structure shall be adequately braced in all directions against wind and belt tension.