

## CHAPTER-XI

### COAL HANDLING PLANT AND DESPATCH ARRANGEMENT

#### 11.1.0 INTRODUCTION:-

The present CHP was planned and designed in 1980 to handle 1.0 Mty of coal and despatch the same to various power houses and miscellaneous customers through rail wagons. The wagon loading capacity was 600 tph. Now in this revised project report it is being contemplated to produce 1.7 Mty of coal from Quarry 1 & 2 so some additional arrangements are required for crushing of r.o.m. coal, coal storage and loading point with conventional loading arrangement for despatch to customer at loading rate of 1200 tph.

In this revised project report it is planned to transport ROM coal from coal face of quarry 1 & 2 upto CHP by means of contractual/hired trucks.

#### 11.2.0 EXISTING CHP (Fig. 11.1):-

R.O.M. coal from the coal faces is being transported upto receiving hoppers of two numbers of feeder breakers by means of contractual trucks. Feeder breakers are used to crush the coal to (-) 200 mm size coal. The crushed coal is then passed through fixed grizzly or vibratory screen for segregating coal into steam and slack steam coal fractions. Steam and slack coal fractions are collected on conveyor C8 and C2 respectively and stored in ground bunker of 7000 t capacity (with 15 numbers of pockets) with separate compartments to store steam and slack coal fractions. Coal fractions are stored in the bunker with the help of conveyor C4 and 8 nos. manually operated ploughs provided on conveyor C4. Steam/slack fractions of coal are reclaimed with the help of reciprocating feeders and carried to conventional loading point with the help of conveyors C5 and C6 in series A wagon hauler is used for wagon movement while loading and 100 t rail weigh bridge is used for wagon weighment. All the conveyors are of 1000 mm wide except loading conveyors i.e. C5 and C6 which are of 1200 mm wide coal is dispatched to various power houses and miscellaneous customers by rail.

### 11.3.0 PROPOSED EXPANSION OF CHP (Fig. 11.1)

One crushing station with one number of feeder breaker and one double roll crusher of 400 tph capacity has been proposed to reduce r.o.m. coal of 1200 mm size to (-) 100 mm size. Crushed coal will be collected on conveyor PC1 and elevated for loading in wagons at the proposed new loading point with conventional wagon loading arrangement. The existing electronic in motion weigh bridge, 100 t capacity for weighing of wagons will be shifted to a new proposed loading point and a new wagon hauler for hauling a rake of 58 'N' Box wagons while being loaded will be provided.

After commissioning of the proposed CHP, the loading conveyor C5 (existing) will be extended by 20 m so that it can discharge on the proposed conveyor PC1. By this existing loading point, conveyor C6, existing wagon loading house, existing wagon hauler etc will be dismantled. Two new crushing stations consisting of feeder breakers and double roll crushers will be established in the existing CHP after shifting the existing feeder breakers to the new location for crushing coal to (-) 100 mm size.

### 11.4.0 DESIGNED PARAMETERS

The design parameters considered for planning of coal handling plant are as given below

#### 11.4.1 BASIC DATA

i)	Annual target output from mine	1.7 mty
ii)	Life of the mine	
	Quarry 1	12 years
	Quarry 2	10 years
iii)	Quality of coal	Non coking, Grade 'D'
iv)	Mode of transport from coal faces to CHP	By hired trucks of 10/20 t cap.
v)	Despatch from CHP	By rail
vi)	Customers	Power houses, miscellaneous

#### 11.4.2 CHP working schedule

The working schedule considered for planning of coal handling plant is as given below –

- |     |                |   |
|-----|----------------|---|
| i)  | Mine operation | 330 days annually<br>3 shift/day<br>5 to 6 hrs. |
| ii) | CHP operation  | 330 days annually<br>3 shift/day<br>5 to 6 hrs. |

#### 11.4.3 System requirements

The system requirements considered while planning of coal handling plant are as given below

- i) Crushing of ROM coal produced by drilling/blasting method
  - Primary crushing - By feeder breakers
  - Secondary crushing - By double roll crushers
  - Size of Infeed coal - (-) 1200 mm
  - End product requirements (-) 100 mm
- ii) Storage - Conventional U/G bunker of 7000 t cap.(existing)
- iii) Coal despatch system- By rail through motorised two way chute
- iv) Weighment of coal- Electronic in motion rail weigh bridge, 100 t cap.
- v) Movement of rakes at loading point: : by Rope Wagon hauler

#### 11.4.4 Salient features

The proposed coal handling plant will consists of the following –

- i) Coal receiving section consisting of feeder breaker and double roll crusher.
- ii) Wagon loading by conventional loading arrangement
- iii) Dust suppression system
- iv) Noise control system
- v) Firefighting system
- vi) Weighment



#### 11.4.5 System Description (Fig. 11.1)

Coal will be produced inside the mine by conventional drilling and blasting method. This coal will be transported to coal receiving section in the CHP on surface by means of hired trucks of 10/20 t capacity

The crushing section will consist of the following:-

- a) Truck Receiving arrangement
- b) Feeder breaker – 1 no.
- c) Double roll crusher – 1 no.

The trucks carrying coal produced by conventional drilling and blasting method will discharge coal in the receiving hopper of the feeder breaker after weighing of coal on 100 t weigh bridge for which 3 nos. of weigh bridges will be installed on surface near CHP. The feeder breaker (primary crusher) will be of 400 tph capacity and suitable to crush the coal from (-) 1200 mm size to (-) 250 mm size and then discharge to the 400 tph capacity double roll crusher. The double roll crusher will be of 400 tph capacity and suitable to crush the coal from (-) 250 mm to (-) 100 mm size.

Belt conveyor PC1 of 1400 mm wide will collect coal from below crusher and elevate to discharge in rail wagons at the proposed conventional loading point for loading coal into wagons with the help of two way motorised chute gate. This conveyor will also receive coal from existing CHP after extension of reclaim conveyor C5.

Wagons will be weighed on an electronic in motion Weigh Bridge, 100 t capacity. Wagons will be moved while loading by means of a wagon hauler and coal will be dispatched to power houses and misc. customer as per requirement.

#### 11.4.6 Plant Description:-

##### 11.4.6.1 Coal Receiving and crushing section

The coal receiving and crushing section to handle coal from the drilling and blasting section of will consist of the following.

- Receiving arrangement
- Feeder breakers (1 no.)
- Double roll crushers (1 no.)
- Conveyor (PC1)

The hired tipping trucks 10/20T capacity carrying coal from the drilling and blasting section of the mine will discharge coal in the hopper of the feeder breaker. The feeder breaker will act as primary crusher. It will be of 400 tph capacity and suitable to receive (-) 1200 mm size coal lumps and crush them to (-) 250 mm size. The feeder breaker will discharge the crushed coal directly to a double roll crusher.

The double roll crusher will be of 400 tph capacity and suitable to crush coal lumps from (-) 250 mm size to (-) 100 mm.

A belt conveyor PC1 (1400mm wide, 1200 tph, 3.0 m/s speed) will collect coal from below the crusher and elevate to load the wagons at the loading point.

At the feeder breaker's receiving hopper for receiving coal from trucks suitable retaining wall, wing walls will be provided to retain the earth and facilitate trucks to discharge coal in the hopper of the feeder breaker.

Suitable ramp and plat form will be provided behind the retaining walls for movement of trucks.

#### 11.4.6.2 Loading arrangement

The rake of 58 wagon will be loaded at a rate of 1200 tph capacity at the new loading point with the help of a two way motorized chute gate with independent motors for each limb. The wagons will be moved by means of a wagon hauler while the wagons are being loaded at constant speed commensurate with the wagon loading rate of 1200 tph.

#### 11.4.6.3 Dust suppression system

Dust suppression arrangement has been provided to suppress dust at all transfer points, truck receiving station, Feeder breaker, crusher, at loading point etc. The dust suppression arrangement will be by spraying plain water in atomized/mist form to have better dust suppression. Necessary full cone type nozzles, pipes, valves, pumps sump, pump house etc. will be provided. Plain water showers will be provided at feeder breaker.

Closed chutes will be provided at all the transfer points to avoid dust nuisance and for proper flow of material. The chutes will be properly lined.

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**11.4.6.4 Noise Control system:**

Required arrangements will be provided to reduce the noise pollution at drive houses, control rooms etc.

**11.4.6.5 Firefighting system:**

Fire extinguishers, Sand buckets will be provided in control room, substation/MCC room to put off minor nature of fires.

**11.4.6.6 Plant Maintenance:**

Travelling type pulley blocks suitable for mounting on mono rails will be provided at transfer points, drive houses, crusher houses to lift the equipment. Fixed type pulley blocks of suitable capacity will be provided in the towers of the counter weights provided for horizontal loop take up of the belt conveyors.

Required tools, tackles, instruments etc. will be provided for undertaking maintenance of the plant.

**11.4.6.7 Weighing arrangement:-**

Coal dispatches through rail will be weighed on a pit less electronic in motion wagon Weigh Bridge of 100t capacity. Trucks carrying ROM coal from mine will be weighed on 100 t capacity road weigh-bridges located at convenient place before loading into the truck receiving hoppers of feeder breakers and for this purpose three numbers of weigh bridges have been provided.

The control room near the proposed road Weigh Bridge will be of modular construction and located very near to the weigh bridge and on right hand side of the road weigh bridge. Will be provided for communication with the driver. The control room will be air-conditioned. Proper illumination, earthing system, lightning protection system will be provided near the Weigh Bridge. The weigh- bridges will be of pit less, electronic type. The weigh- bridges will be provided with required electronics, print out facilities. The print out facility will facilitate in keeping records of weighment.

The weighing electronics of the in motion Weigh Bridge will be installed in the control room provided near the wagon loading station.



**11.4.6.8 Modification in the existing CHP:**

The existing feeder breakers will be shifted to a new location and reinstalled along with the double roll crushers to crush coal to (-) 100 mm size. The existing conveyor will be extended to receive coal from the crushers. The existing belt conveyor C5 will be extended to discharge coal on the proposed conveyor PC1.

**11.4.6.8 Power Supply and Control circuits :**

One 6.6 kV overhead line with ACSR/AAAC conductors (Wolf) will be drawn from the projects substation up to CHP substation located near the crushing station and will be terminated on a four pole structure.

All the equipment in the CHP will operate at 415/230V, 50HZ supply. For this purpose one number of substation will be provided near the crushing station.

At the substation 6.6 kV circuit breaker, power transformer, lighting transformer, 415V MCC, lighting switch board, etc. will be provided. All the required protections for over current, short circuit, earth fault, earth leakage etc. will be provided.

The conveyor gantry, transfer house, drive house, crushing complex will be illuminated by 70W HPSV lamps with well glass fittings or CFL fittings. For illumination of CHP out door- yard, high masts of 15/30 m height with required 400W metal halide lamps will be provided at suitable locations. The service roads will be illuminated by means of 150/250 W HPSV lamps in street light fittings mounted on poles. The service buildings such as sub stations, control rooms and other rooms will be illuminated with the help of fluorescent tube lamps or CFL fittings.

Required earthing system, lightning protection system, safety equipment, communication equipment will be provided.

The substations will be pressurized and control rooms will be air-conditioned.

All the equipment working in the coal flow of proposed expansion, Reciprocating feeders below U/G bunker, Conv. C5 will be operated and controlled sequentially. For this purpose one control room will be provided near the wagon loading station All other equipment will also be controlled from the control room. The control system will be of PLC type. Required mimic panels, annunciator panels will be provided in the control room.

Local control switches will be provided at each drive to facilitate for repair and maintenance of the equipment.

### 11.5 Estimates:-

The details of the equipment along with the estimated cost have been worked out and are shown at **Appendix A.3.5**

The details of manpower requirement for the operation and maintenance are shown at **Appendix-B**

### 11.6 Railway siding:-

#### 11.6.1

A railway siding with three line is existing. Inner line is used for Rajnagar u.g. mine, middle line is used as engine escapae line and Outer third line is used for Rajnagar OCP. Some modifications are required to accommodate new loading station.

#### 11.6.2 Weighing arrangement:-

Weighment of coal will be done in an electronic in motion weigh bridge 100 t installed at proposed loading point.

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