

## CHAPTER - XI

### COAL HANDLING & DESPATCH ARRANGEMENTS

#### 11.0. INTRODUCTION

The present Coal Handling Plant envisages the coal collection from two sections of the mine. One from in pit for seam (Lower) evacuation and another for seam (upper) evacuation. It has been proposed that coal collected from upper seam, the mine shall be fed to the APGENCO washery at the surface, henceforth processing, handling, collection of coal from the washery, its storage and loading to the silo etc. shall be done by the APGENCO washery authorities. Part of the coal received through pipe conveyor from upper seam will be diverted to truck loading system for dispatch. Coal from lower seam will be collected and conveyed through in pit conveying system. It will be stored at surface in a bunker and finally loaded into railway wagons through silo and RLS system.

Balram OCP is being planned for a targeted production of 15 Mty. The life of the mine is 52 years. In the initial stage i.e.; up to 15 years of mine evacuation approximately 10 Mty coal shall be produced from the lower seam i.e.; seam III, balance shall be produced from the upper seams. After 15 years the targeted production shall be reversed i.e.; approximately 10 Mty shall be produced from the upper seams and balance shall be from the lower seam. For flexibility point of view the capacity for both the streams has been kept identical.

Out of 15 Mty production plan, 7 Mty shall be fed to APGENCO washery, whereas the balance shall be evacuated through silo loading of ROM coal, and road sale or shall be fed to Hingula washery.

It has been proposed that entire coal (-100 mm) shall be produced through blast free i.e. through surface miner.

The present proposal has been prepared for two variants as described below:

  
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Variant – I: Departmental variant (coal by surface miner).

Variant-II: Partial outsourcing variant (coal by surface miner). Coal Handling Plant has been envisaged same for both the variants.

## 11.1. EXISTING STATUS

A Coal handling plant for Balram open cast project was constructed and commissioned. The CHP consisted of crushing complex (Feeder breakers – 4 nos), associated conveyors and truck loading hoppers for dispatch through trucks.

These systems shall operate further till commissioning of proposed CHP for evacuation of 4 Mty coal to road sale or Hingula washery.

## 11.2. DESIGN PARAMETERS

The design parameters considered for the proposed Coal Handling Plant are as under:


### 11.2.1. BASIC DATA

#### 11.2.1.1. GENERAL

(a) Location	:	Talcher coalfield of Mahanadi Coalfields, Orissa
(b) Annual mine target	:	15.0 Mt of coal
(c) Quality of coal	:	Grade – G12
(d) Main consumer	:	APGENCO
(e) Life of the mine	:	51 yrs.

#### 11.2.1.2. COAL HANDLING PLANT

• Handling capacity	:	15.00 Mty
• No. of working days/year	:	330 days
• No. of working shifts/day	:	3
• Effective working hrs/shift	:	5
• Bulk density of ROM coal	:	
❖ For capacity calculation	:	0.8 tonne/cu.m

  
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- ❖ For load calculation : 1.2 tonne/cu.m.
- Product size : (-)100 mm

#### 11.2.1.3. COAL RECEIPT AND DISPATCH ARRANGEMENT

- a. ROM coal size : (-) 100 mm
- b. Coal Receipt : By reclaim feeder within the mine along the inpit trunk conveyor for evacuation of lower seam coal, and reclaim feeder along with Pipe conveyor along the boundary of Hingula and Balram OCP for upper seam coal.
- c. Coal Transport : By a series of inpit belt conveyors to surface for lower seam coal and loading into railway wagon through proposed Silo. Pipe conveyor from upper seam to proposed APGENCO washery and proposed conveyor to truck dispatch system.
- d. Proposed Dispatch : 7.0 Mty - through proposed CHP to APGENCO washery, 3 Mty by proposed truck loading system and balance 5 Mty to proposed Railway Wagon through proposed Silo in initial years and at later years 10 Mty can be loaded through proposed silo when production from lower seam reaches at peak.

#### 11.2.1.4 SYSTEM CAPACITY OF CHP

The mine is being planned for producing 15 Mt of coal in a year. The coal handling system is planned for handing of entire coal produced from the mine. The coal has been planned to be produced by blast free technique ie;

through surface miners. The ROM coal size shall be (-) 100mm. With the parameters narrated above i.e.; 330 working days in a year and three shifts in a day having 5 hours the system capacity envisaged at 3000 tph for entire coal handling plant.

However out of 15 Mty coal produced 7 Mty shall be fed to APGENCO washery, 3 Mty by proposed truck loading system and balance 5 Mty to Railway Wagon through proposed Silo in initial years and at later years 10 Mty can be loaded through proposed silo when production from lower seam reaches at peak.

#### 11.2.1.5 SALIENT FEATURES OF CHP

The coal transport is being planned from in pit itself. Thus there is a remarkable reduction in dumper population in connection with the coal transport by dumpers up to surface.

Further the huge and complicated structures inside the mine like truck / dumpers, receipt hoppers have also been eliminated by introducing shiftable reclaim feeders within the mine/ coal receipt locations.

### 11.3 PLANT DESCRIPTION

#### 11.3.1 IN PIT COAL RECEIPT & TRANSPORT

- **RECLAIM FEEDERS**

Coal of (-) 100 mm size produced by surface miner in the mine shall be transported by tipping trucks/ dumpers and discharged at a suitable location as indicated in the plan for lower seam and upper seam, where the Reclaim feeders are installed. The quantity, capacity and location of reclaim feeders deployment has been given below. Also two no of dozers each has been envisaged for channelizing of coal to the reclaim feeders at each coal receiving center, which is likely to be arranged from the mines.

The technical parameters for design of reclaim feeders are as under

Quantity	:	8 (Eight)
Location	:	4 Nos. At Seam III and 4 Nos. for upper seams Seam II (2 working

and 2 standby at both the seams)

Rated Capacity	:	0-1500 TPH
Material to be handled		Coal
Bulk Density	:	0.8 to 1.2 t/m <sup>3</sup>
Material size	:	(-) 100mm
Maximum inherent	:	8% moisture content

#### • IN PIT CONVEYING

Coal shall be receipt by reclaim feeders within the mine and shall feed into the belt conveyors IC1 and IC2. Initially when mine excavation area is less the coal receipt system is feeding to the belt conveyor installed at mine as shown in the plan. Initially the conveyor IC1 shall be installed with lesser length of conveyor as total length envisaged for this conveyor. With the development of the mine the tail end shall be extended towards the dip to attain the total length of this conveyor as envisaged. With further development of the mine IC2 shall be installed. Now the coal receipt system shall be shifted to feed the conveyor with mine development. Then the coal shall be transported to surface through a transfer house in between. The layout of these conveyors may change during final design as per availability of space.

#### • SURFACE COAL TRANSPORT

In this project the surface coal transport has been envisaged in two parts

- i) Coal receipt from in pit for the lower seam and transport upto proposed transfer house at the surface and loading into Railway wagon through proposed Silo.
- ii) Coal receipt at surface for upper seam coal and transport up to transfer house located at surface for receiving of coal from in pit to proposed pipe conveyor which shall load into APGENCO washery and part of it to proposed truck loading system.

#### 11.3.2 STORAGE & RECLAIM

Storage and reclaim from washery shall be done by the APGENCO washery authorities. Part of the coal (5 Mty in initial years and at later years 10 Mty can

when production from lower seam reaches at peak) shall be stored at surface in 20000 te bunker and loaded into railway wagons through silo and RLS.

### **11.3.3 WAGON LOADING SYSTEM**

Storage and reclaim from washery shall be done by the APGENCO washery authorities. Remaining coal (5 Mty in initial years and at later years 10 Mty can when production from lower seam reaches at peak) shall be stored at surface in 20000 te bunker and loaded into railway wagons through proposed silo and RLS for Balram Project near siding 9-10. Below hopper RLS, two numbers pre-weigh hoppers with one telescopic chutes in each are provided for loading facility.

OHE system below the silo is also being proposed.

The load out system shall be complete with power pack, level sensors and microprocessor based controls for the operation of the gates and chutes in a preset sequence for uniform and correct loading of wagons. The pre-weigh hopper filling capacity shall be selected in accordance with the type of railway wagons arriving under the loading station.

The system shall permit loading of each wagon with pre-weighed quantity of coal, thereby eliminating the necessity of any wagon weighing equipment.

### **11.3.4 WEIGHMENT**

For the purpose of weighment, belt weighers have been envisaged. In addition, for recording of weight of coal dispatched, pre-weigh system of weighment has also been envisaged with the wagon loading system.

### **11.3.5 DUST EXTRACTION:**

The objective of the system is to extract coal dust from various dust generating points, clean the dust laden air by trapping coal particles and finally discharge clean air into the atmosphere so that dust concentration in the CHP premises, even under the critical worst operating condition is less than stipulated limit.

### **11.3.6 DUST SUPPRESSION SYSTEM:**

The objective of this system is to eliminate the air borne coal dust or suppresses the coal dust at its source. The system involves confinement of the dust within the dust producing area by a curtain of moisture and wetting the coal dust by direct contact between the particles and droplet of water. Adequate number of precision anti-cog nozzles will be installed at suitable locations for suppressing dust by spraying water. Suitable control for dust suppression shall be provided and the system shall be so interlocked that it operates only when the conveyor system is operating or the loading operation is on.

### **11.3.7 Noise Control**

It is well-accepted fact that noise pollution causes fatigue to operating personnel. Provision will be made to keep down the noise level to the extent it is feasible as per relevant IS/ International standard. All machine mounting will have in their foundation anti-vibration pads/sheets for reducing the vibration and thereby noise. All transfer chutes and hoppers shall have wear resistant rubber or ultra-high molecular weight plastic liners of various thicknesses as per design requirement and their suitability.

### **11.3.8 Fire Fighting System**

Necessary firefighting system along with fire detection system has been envisaged for the plant. The fire detection unit shall be located at strategic location of the proposed plant. In addition, portable fire extinguishers to deal with electrical/oil/ordinary fires shall be provided at all strategic locations in the plant.

### **11.3.9 Plant cleaning System**

To facilitate cleaning at strategic locations ample number of high pressure water servicing points have been envisaged. These service points will be provided with quick connecting hose couplings for easy fixing and dismantling of hoses. To handle discharge from plant effluent, washing of the plant area, sump pumps of suitable design and capacities have also been envisaged

where required. Plant effluent shall be discharged through open drain/pipe after proper treatment.

### 11.3.10 Plant Maintenance System

For effective maintenance of all the equipment, there will be sufficient working space around the equipment/machinery. All the equipment and conveyor discharge drums/transfer points etc. shall have covered and well ventilated housing complete with access stair ways, hand rails, platforms, cross over ladders etc. as required. Necessary electric hoists and chain pulley blocks at suitable points of adequate capacity will also be provided on various floors.

## 11.4 ELECTRICAL

The electrical system for reclaim feeders and in-pit conveyors and other conveyors the following electrical system has been envisaged:

- Power reception and distribution system.
- Centralised sequence control-cum-interlocking, automation, signaling and instrumentation system.
- Illumination of plant and adjacent area.
- Centralised welding circuit.
- Earthing

## 11.5 CAPITAL REQUIREMENT

The estimated capital requirement for 15 Mtpa Balram CHP is 821.55 Crores. The detail of capital requirement is given in Appendix-A.3.5.

## 11.6 RAILWAY SIDING

### 11.6.1 General Information

Approx. 5 MTPA coal from Balram OCP will be dispatched by proposed RLS system in initial years and at later years 10 Mty can be loaded through proposed silo when production from lower seam reaches at peak. A new Railway siding has been proposed near siding 9-10. This proposed Railway



Siding and loading point including other infrastructures near proposed siding are tentative and it can only be finalized in consultant with RITES/Railway agency. Accordingly the loading facility and alignment may change after finalizing the railway siding.

### **CAPITAL REQUIREMENT FOR RLY SIDING**

The estimated capital requirement for Railway siding is 98.90 Crores. The detail of capital requirement is given in Appendix-A.5.



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