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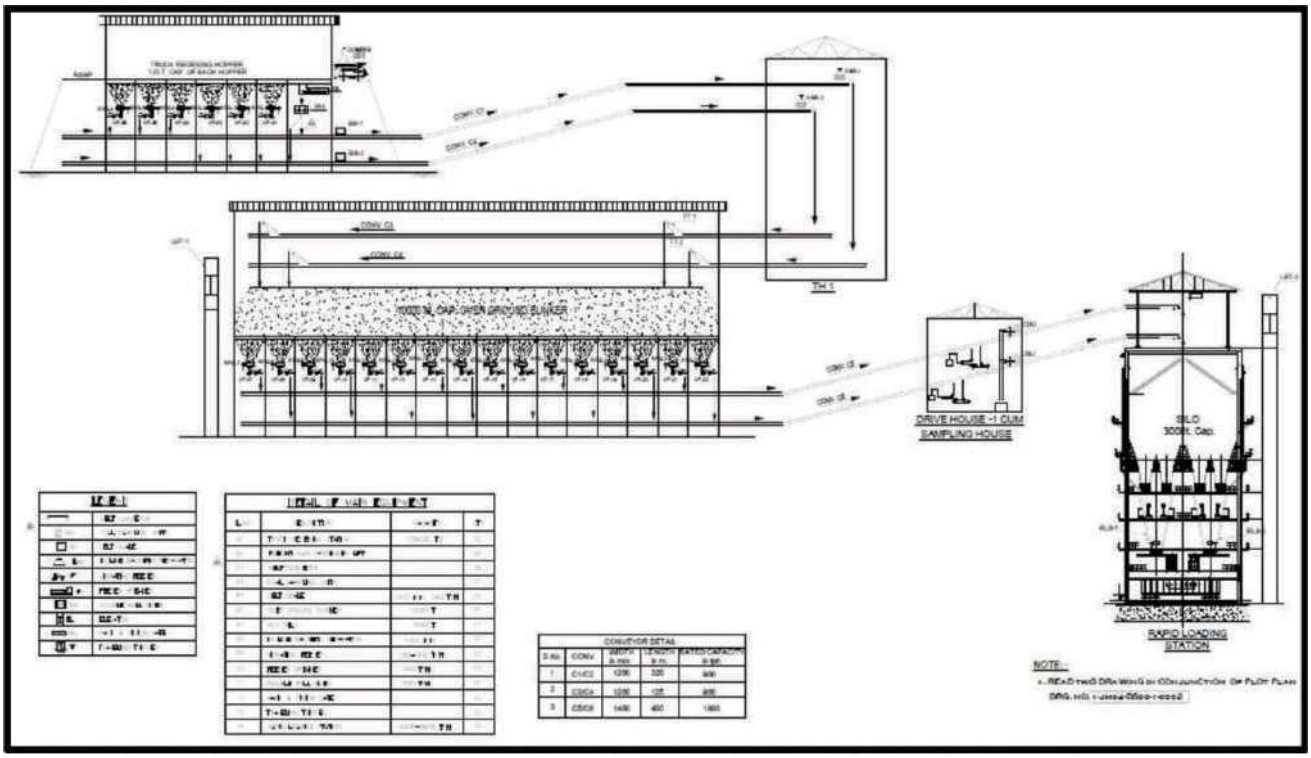
Coal Handling Plants with Rapid Loading Systems attaining newer engineering dimensions at McNally Bharat

McNally Bharat Engineering Company Limited MBE has been contributing significantly towards facilitation of First Mile Connectivity under Union Ministry's National Coal Logistics Plan. This is through setting mechanized coal loading and transportation in Indian Railway's freight wagons. ***Railways Review*** Journal takes a look at South Eastern Coal Limited's Chhal and Baroud's Rapid Loading Systems, set up by McNally Bharat, featuring critical value engineering which have successfully loaded and dispatched 319 and 565 rakes respectively till November 2024 ever since it's commissioning in February 2024.

MBE is the pioneer in the field of bulk material handling mainly coal/ lignite handling plants. It is worthwhile to mention that first indigenously built Coal Handling Plant in India was installed by MBE for Talcher Thermal Power Station for Orissa Electricity Board in 1968. The first Coal Handling Plant with Rapid loading silo in India was also installed by MBE. MBE has built on EPC basis more than 140 bulk material handling plants.



These are mostly coal handling plants ranging between capacities from 500 TPH to 3000 TPH.

To strengthen India's energy security and realize the vision of Atmanirbhar Bharat by reducing the reliance on imported coal, the Ministry of Coal is actively working on development of the National Coal Logistic Plan. This includes First Mile Connectivity (FMC) through railway siding near coal mines. The Ministry of Coal has prepared plan to improve the mechanized coal transportation and loading system with RLS under FMC projects.

In an ongoing pursuit of sustainable development and environmental conservation, the concept of First Mile Connectivity has emerged as a game-changer. First Mile Connectivity eliminates road transportation of coal in mining areas using conveyors or roads to the nearest railway siding. By transporting coal through a conveyor belt or road to the nearest railway siding, FMC reduces the number of trucks on the road and the associated environmental impacts such as air pollution, traffic congestion, and road damage, leading to a cleaner and healthier environment.

A total of 67 First Mile Connectivity (FMC) Projects (59 – CIL, 5- SCCL & 3 – NLCIL)with 885 MT capacity are being taken up in three phases. These are so as to achieve capacity of ~1BT mechanized handling of coal. In line with the goal of PM Gatishakti, the Ministry of Coal has undertaken railway projects costing Rs. 26000 Cr to develop multimodal connectivity.

MBE JV bagged five such projects from Coal India Limited. Two of these plants at Chhal and Baroud under SECL have already been constructed and in full operation. Another two are ready for commissioning with one under advance stage of erection.

MBE's – A One Stop Solution for:

- Basic & Detail Engineering
- Manufacturing of Equipment
- Procurement & Supply
- Project Management
- Quality Assurance & Surveillance
- Civil & Structural construction
- Erection & Commissioning
- After Sales Service
- Operations & Maintenance

RAPID LOADING SYSTEM

The Rapid Loading System (RLS) in coal handling plant is a facility for flood loading of wagons by combination of state of the art technologies with ultra modern PLC based equipment. These systems are critical in ensuring that coal handling plants operate efficiently, minimizing the time and resources required to load coal and reducing bottlenecks in the supply chain.

Chhal CHP and Silo consists of one number of Silo of 3,000 MT capacities (self-flowing) with 2 numbers of pre-weigh hoppers of capacity 100 MT (minimum) and two numbers of Rapid Loading System (RLS) outfits with the average loading rate of 4500-8500 TPH.

The RLS is designed for loading coal into railway wagons with capacity of one wagon per minute approx. The entire telescopic chute arrangement is made in such a way that it enables the movement of electric loco under the silo for loading of rake. The required clearance between the rail top and the bottom of pre-weigh hopper is maintained and minimum head room is provided to have the requisite clearance above the OHE line to enable operation of electric or diesel loco under the silo.

All civil and structural works of the silos are done keeping in view the allowable clearances by the Indian Railways to enable passing of two electrified railway tracks and smooth operation of the two RLS below the silo. The telescopic chute is capable of handling semi solid / slurry material in rainy season. The equipment is required to operate 18 hours a day and 330 days a year, but the design is such that it can be operated 24 hours a day and 365 days a year.

The RLS at SECL installations have arrangement such that pre-weighed quantity of coal is discharged into each wagon and the individual weight is recorded automatically when the weigh system is put in auto mode. Air vents are provided between the pre-weigh hopper and 3000 tonne silo to allow displaced air from the weigh bin is captured and prevent dust escaping from the system. Adequate numbers of heat sensors are provided.

Through the RLS BOBRN type wagons can be loaded (One rake consists of 60 wagon each of capacity 65 Ton) BOXN type (One rake consists of 60 wagon each of capacity of 70 tons), NS variant (One rake consists of 60 wagon each of capacity 70 Ton)

Wagon tippler: Bandel Thermal Power Station, under West Bengal Power Development Corporation is looking to modify the existing wagon tippling arrangements to handle higher number of wagons. The facility has got two old tippler arrangements installed and commissioned in 1962 from Hely & Patterson Co USA, having capacity of 100 tonne, with time taken per cycle of 130 sec, 25 HP (380V/ 40 HP Motor

Oversized coal boulders are being manually broken at the plant's hopper following unloading at the tipplers

Dust suppression arrangements on the hopper

This RLS project was under the "PM Gati Shakti National Master Plan" and the plant was commissioned on 24-Feb-2024. Till 26-Nov-2024, 313 rakes have been loaded with coal through this rapid loading system and thus transported 1.25 million tonnes of coal to various thermal power plants.

COMPLETE SCOPE OF WORK IN CHHAL OCP UNDER SECL

MBE's scope of work at Chhal OCP under SECL was complete in its entity. This consisted planning, design, engineering, construction, fabrication, erection, supply, installation, testing followed by trial run and commissioning of one number RCC Silo each of 3,000 tonne capacity with Rapid Loading System of 4500-8500 TPH.

The scope of work also included setting up of one set of crushing cum truck receiving station, RCC overhead Bunker of 10,000 tonne and associated belt conveyors with transfer house for reclamation of coal from the

crushing cum truck receiving station and feeding it to the bunker and then to the RCC Silo. The work was inclusive of all civil and structural and electrical and mechanical works and allied auxiliary facilities. This consisted of dust suppression system, fire fighting system, plant cleaning system, sampling system, condition monitoring system, drinking water supply system, service road. Work also included general development, drainage on turnkey basis for loading of raw Coal into rail wagons at Chhal OCP in SECL under CIL with rated capacity-6.0 MTY.

A similar project has been constructed by MBE JV at Baroud OCP near Raigarh in Chhattisgarh under SECL and is now under full operation with optimum capacity. This project was also under the "PM Gati Shakti National Master Plan" and the plant was commissioned on 24-Feb-2024. Till 30-Nov-2024, 565 rakes have been loaded with coal through this RLS and thus transported 2.23 million tonnes of coal to power plants. RR