

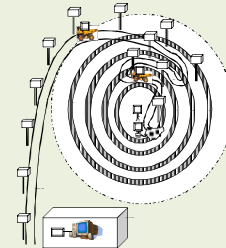
A microprocessor based multi-channel intrinsically safe real-time environmental monitoring system



- The system continuously monitors of vital parameters, namely, methane (CH₄), carbon monoxide (CO), air, velocity, temperature and machine status in underground mines.
- Provides on-line visual representation of trend of all the monitored parameters
- Provides audio-visual warning signal when a particular parameter crosses the respective threshold limit and switch off the power supply in case of high CH₄ concentration to prevent explosion.
- Transferred to Environmental Division of M/s Jagadamda Tyre Retreading Co., Dhanbad.

Tracking and monitoring system for opencast mines

- Dumper tracking system in opencast mines for optimal shovel-dumper performance, and
- Production monitoring & improvement of productivity.
- The technology is transferred to M/s Safe Instruments, Mohali.



Proximity Warning Device For Heavy Earth Moving Machinery



Dumper backing in loading or unloading points

Two dumpers coming from opposite directions in a hilly area

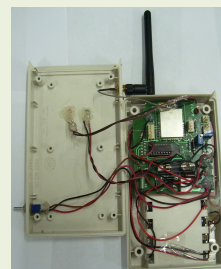
- Used for giving warning to the dumpers operators coming closer to each other
- Enhanced safety and save precious life and property
- The technology is transferred to M/s Safe Instruments, Mohali

Wireless Information and Safety System for Underground Mines

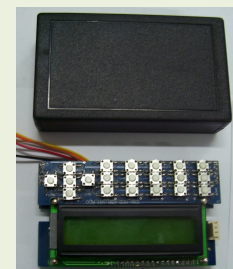
- Wireless tracking system using RFID technology,
- Disaster locating system for speedy rescue operation,
- System for prevention of vehicle collisions,
- Wireless gas monitoring system for underground mines,
- Message device for underground mines.
- The technology is transferred to M/s Safe Instruments, Mohali.



Coordinator



Router / End Device



Message Device

Design of Highwall Mining to recover locked-up coal in Opencast Mines

CSIR-CIMFR is instrumental in adapting this new technology for Indian geomining conditions by providing scientific extraction design for the first three Highwall Mining sites at Ramagundem Opencast Project-II, Medapalli Opencast Project of M/s Singareni Collieries Company Ltd. (SCCL) and Quarry (SEB and AB), West Bokaro of M/s Tata Steel Ltd (TSL).

With the scientific design capability developed by CIMFR, the coal mining companies in India and abroad can now procure the machinery and extract the locked-up coal resource safely and economically by Highwall Mining.



Plate-1: Scientists of CIMFR, Mine Management of MOCP and representative of AMT are discussing at the site of MOCP on the design aspects of Highwall Mining



Plate-2: Birds eyeview of Highwall Blocks D & E of MOCP

Total investment of Rs. 125 crore, coal extraction in the tune of 4000 – 5000 t per day is possible with 20 to 30 skilled manpower and the capital investment is recoverable within 6 months.

MINI COAL WASHERY (MINI FLOTATION PLANT)



Technical Data (Capacity – 10tph)

Input Coal (Slurry)

10-12tph, 25-30% ash, 20-25% moisture

Output Products

Clean Coal – 6-7tph, <15% ash, <20% moisture

Tailings – 4-5tph, >45% ash

Infrastructure

Plant covered area – 240-260 m², Plant shed ht -7.5-8.0 m²,

Settling pond area -750-800 m²

Power: Installed Power – 150 HP

Other Consumables: Fresh Water-4-6 m³/hr,

Collector- 20-50 l/hr, Frother-0.3-0.5 l/hr

Manpower: Skilled – 3-5 nos. Unskilled – 10-12 Nos.

CSIR-CIMFR, developed anoble technology for beneficiation of effluent discharged by Large Coking Coal washeries in India. These Effluents settle in the settling pond and surrounding land and create environmental pollution. The clean coal generated from the mini flotation plants are found to be of superior quality for metallurgical industries.

Novelty of the Flotation Process

Technology:

- Individual design of flotation Cell with automatic self-suction of input slurry from conditioner.
- Belt discharge Rotary drum vacuum filter in place of Rotary disc filter.
- Use of commercially available synthetic frother instead of pine oil.
- Percolating bed gravity filtration pond for drying of tailings instead of dewatering system.
- Use of low powered indigenously designed Emulsifier
- Completely closed water circuit (zero discharge)
- No water and air pollution

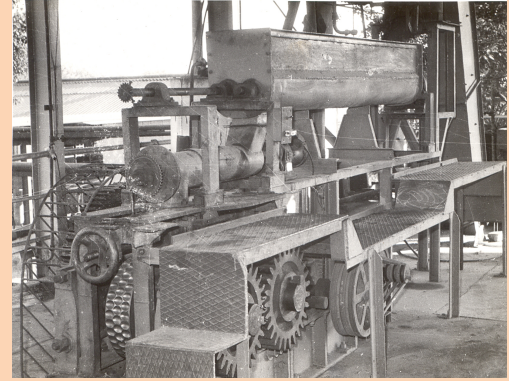


Briquette Fuel from Coke Breeze for Industrial Use



Domestic Fuel Briquette from Coal Washery by Product

The process involves crushing of coke breeze/char to 3mm followed by mixing with requisite quantity of binder. The mixed raw material is then subjected to kneading in presence of steam. The kneaded material at a particular temperature is conveyed to briquetting press. The green briquette produced are conveyed to grizzly for screening the broken briquettes. The green briquettes are then put into trolleys and cured for 3 hours at a specific temperature. The cured briquette is then sent to despatch.



Briquette Manufacturing Plant

- Raw Material Used: Coke breeze, Char, etc.
- Binder: Organic binder
- Size of Briquette: 35 x 45 x 20 mm/ 55 x 40 x 20 mm
- Shape of Briquette: Oval
- Utility items required: Water, Steam
- Power Required: 40 to 45 kwh/te
- Viable Commercial Plant: 1 tonne per hour
- Cost of 1 tph plant: Rs 50-60 lakh
- Yield: 1.05 te/te of coke breeze
- Processing cost: Rs 1000 /te (inclusive of the cost of binder)

SOFT COKE OVEN

Technology for Soft Coke Production (Devolatilization of Coal)



IMPROVED ANGETHEES / CHULLAH



Process Description

The sized (+50mm) non coking coal is charged in the coke oven through charging holes from oven top. The coal is devolatilized at a specific temperature for a specific period of time after which it is discharged and quenched on the platform. The soft coke is sent to the stock yard after atmospheric drying.

Raw Material

Sized (+50 mm) Non-coking coal
 Product: Coke for domestic use
 Product size: + 20 mm
 Water Requirement
 0.50 te/te soft coke
 Power: 1 to 2 kwh/te
 Viable Commercial Plant: 50 tph
 Cost of 50 tph plant: Rs 20 lakh fixed capital
 Yield: 80-85 % of coal charged

- Portable, domestic and improved version.
- Having provision of low cost clay insulation.
- Suitable for low V.M. Coal/Coke/soft Coke / Pellets/ Briquettes etc.
- Low pollution level