

Coal Mining & Rescue in SCCL



THE SINGARENI COLLIERIES COMPANY LIMITED

(A GOVERNMENT COMPANY)

Coal in India

- India is the 3rd largest coal producing country
- Coal deposits are spread over 27 major coal fields.
- The lignite deposits are around 38.7 billion tonnes.

Coal in India

- 257 Billion tonnes of coal resources are estimated in the country as on 01.04.2007.
 - Singareni has 17.7 Bt total reserves including 8.8 BT proved
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Singareni



Dr. William King
discovered coal in
Singareni Village.

Singareni is
mining coal
since 1889.



Geography

- Godavari Valley Coalfields of Singareni stretches over 350 Kms of Pranahita-Godavari Valley of Andhra Pradesh in the 4 districts of Adilabad, Karimnagar, Warangal and Khammam.
- For the purpose of Administrative convenience the coalfields are divided into 3 Regions and 10 Areas.

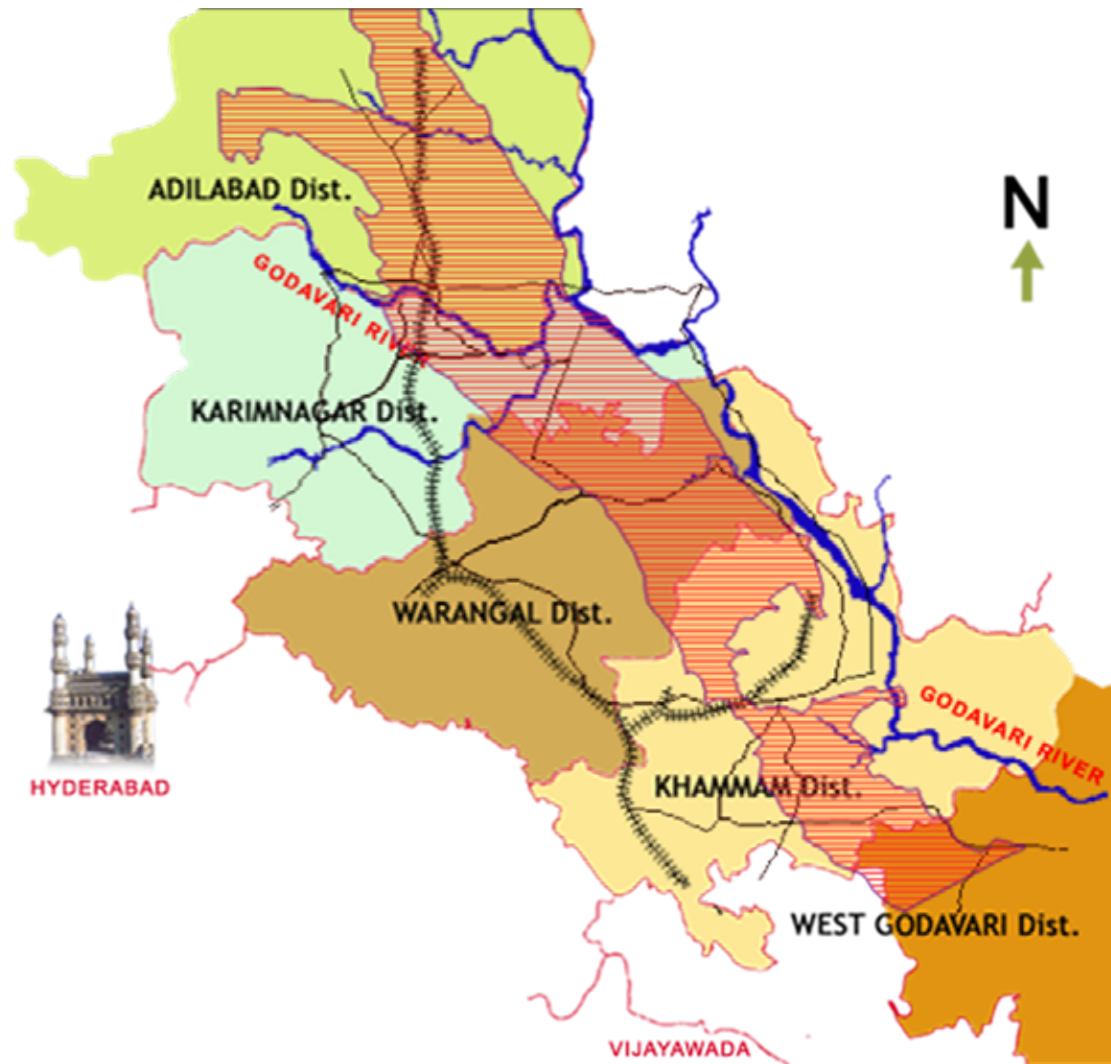


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The Godavari Valley Coalfield



LOCATION

MINES

The Singareni Collieries Company Limited currently operates

- 36 Underground Mines
 - 14 Opencast Mines
 - Manpower : 70,551
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PRODUCTION OF SCCL AT A GLANCE

	2005-06	2006-07	2007-08	2008-09
Coal Production (Mill.Tons)	36.14	37.71	40.60	44.44
Coal despatches (Mill.Tons)	35.32	37.48	41.79	44.41
Productivity(OMS)	2.16	2.39	2.63	3
OB Removal(Mill.Cu.Mt r)	115.58	139.86	140.727	184.64
Manpower	86,025 (As on 31-03-2006)	82,224 (As on 31-03-2007)	75,573 (As on 31-03-2008)	70,586 (As on 31-03-2009)

MINES- Operational Profile

- The underground mines are non-gassy.
 - Some seams are prone to spontaneous combustion.
 - Mines are geologically disturbed and faults are encountered frequently.
 - Gradient 1 in 8 to 3.
-

Our Technology – Under Ground

Technology

- *Conventional underground mining*
- *SDL & LHD*
- *Road Headers*
- *Longwall*
- *Blasting Gallery*
- *Highwall*
- *Continuous Miners*

Operational Profile

- *36 UG Mines*
- *Coal: 12.6 MT*
- *Depths operated: 400 mts*
- *Depths Planned: 650 Mts.*



SCENARIO OF MECHANISATION & SEMI-MECHANISATION - UG MINES

TECHNOLOGY	NO.OF U/G MINES	NO.OF UNITS	AV. ANNUAL PRODUCTION, T	APPROXIMATE CAPITAL OUTLAY INR, MILLION
SDL	21	97	39,07,000	250
LHD	6	33	14,70,000	150
LONG WALL	7	9 UNITS WORKED	27,00,000	8000
BG	4	16 LHD	4,10,000	1600
RH	4	7	1,35,000	70
CM	1+1	1+1	8,00,000	1420

OUR UPCOMING U/G PROJECTS – NEW GENERATION LONGWALLS

SL. NO .	NAME OF THE PROJECT	PLANNED PRODUCTION, MTPA	CAPITAL INVESTMENT, INR MILLION	GRADIENT OF THE SEAM
1.	ADRIYALA	2.810	8874	1 in 6 to 7.2
2.	JALLARAM	2.574	4029	1 in 5 to 8
3.	SHANTHIKHANI	1.167	2490	1 in 3.5 to 5
4.	KLP	2.747	4536	1 in 2.8 to 3.3

Our Technology – Opencast



Technology

- **Draglines**
- **Shovels & Dumpers**
- **Surface Miners**
- **Inpit crushing – Conveying – Spreading**

Operational Profile

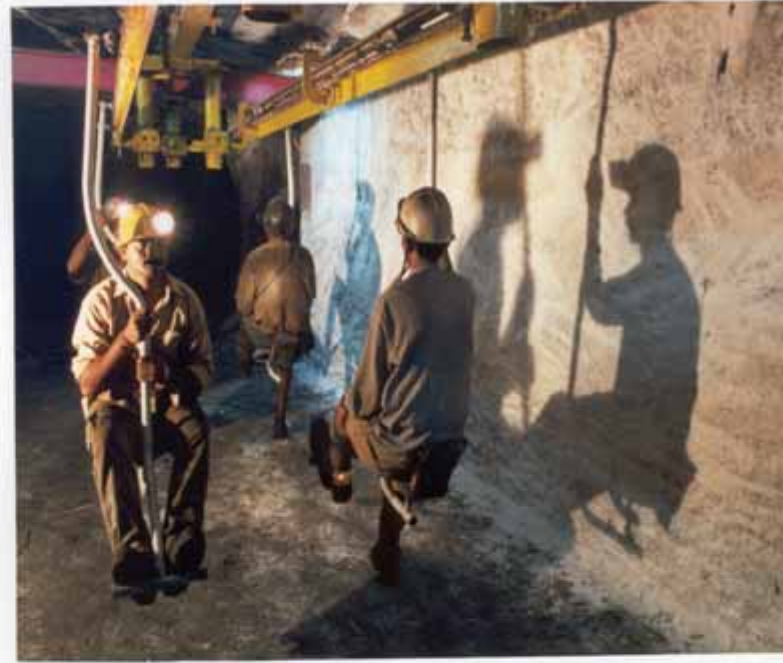
- **14 OC Mines**
- **Coal: 28.0 MT, OB: 141 M Cu M**
- **Stripping Ratio: upto 1:6**
- **Gradients operated : upto 18°**
- **Depths operated: 170 Mts.**
- **Depths Planned: 400 Mts.**

Contractual Operations in SCCL

- In all OC Mines of SCCL Contractual Mining for OB removal is in operation.
- During 2007-08,
 - Total OB removed - 140.70 Million M³
 - OB handled by contractors - 97.8 Million M³
- The capacity of Shovels used by Contractors are ranging from 3.3 M³ to 14 M³
- Dumpers are ranging from 30 T to 100 T

OUR PARTNERS IN PROGRESS

- ❖ **DBT – CONTINUOUS MINER**
- ❖ **CSIRO, AUSTRALIA – COLLABORATIVE RESEARCH
AGREEMENT IN LONGWALL MINING**
- ❖ **CARBON ENERGY – UCG,SCG**
- ❖ **RMT – UG STRATA MONITORING**
- ❖ **CdF, FRANCE – GALLERY BLASTING**
- ❖ **CMC, CHINA – LONGWALL MINING**
- ❖ **BMCL,UK – LONGWALL MINING**
- ❖ **RWE, GERMANY –IN-PIT CRUSHING/ OCP SLOPE STABILITY
STUDIES**
- ❖ **JOY MINING – CONTINUOUS MINER**



Let us proceed to Rescue



MINES RESCUE SERVICES

SINGARENI COLLIERIES COMPANY LIMITED
A GOVT COMPANY



HISTORICAL DEVELOPMENT OF MINES RESCUE IN INDIA

- The first mine rescue station in India was established in Kolar Gold fields in 1923.
- The necessity of well equipped rescue stations was deeply felt after a series of fires and explosions shook the Indian mining industry in 1930's.

RESCUE RULES

Rescue Rules were promulgated in India in 1939 and two Central Rescue Stations were established in August 1941 at

- Dhansar (Jharkhand)
- Sitarampur (West Bengal)

RESCUE RULES - MODIFIED

The Rescue Rules were modified in 1959.

- Central Coal Mines Rescue Station Committee (CCMRSC) was formed.
- 13 Additional Rescue Stations were established including 2 in Singareni at Kothagudem & Bellampalli.
- Metal Mines (U/G) also established 6 Rescue Stations.

RESCUE RULES-1985

The Rescue Rules 1959 was replaced by Mines Rescue Rules 1985.

- CCMRSC was made defunct.
- All the Rescue Stations were handed over to the respective mining companies.

RESCUE STATION IN INDIA

At Present:

46 Rescue Stations in Coal Mining.

6 Rescue Stations in Metal Mining.

3 Types of Rescue Service Points

1. Mines Rescue Station (MRS) : It is the Central Station established by one Company for all its mines.
2. Rescue Room (RR): For one mine or a group of mines where there is no rescue station within a radius of 35 kms.
3. Rescue Room with Refresher Training Facility (RRRT): If the total number of persons employed in a group of mines exceeds 5000 persons.

Rescue Trained Persons in Mines



- More than 100 persons
Avg. Below ground employed: 5 rescue trained persons should be readily available at surface at any time.
- More than 500 persons Avg. Below ground employed: Additional 1 person for every 100 persons.

INITIAL TRAINING

- Initial training in Rescue & Recovery is given for a period of 14 days.
- Refresher training is for 8 days; 4 days in mines and 4 days in training gallery.



Rescue Service Points- SCCL

- SCCL has established 6 Rescue Service Points for catering the Rescue needs of the mines
- These are strategically located within 35Kms of mines as per the Mines Rescue Rules 1985

- The six rescue service points are manned by a core group of 60 Rescue Brigades and assisted by 600 Active Rescue Trained Persons from Mines.
- One out of every 100 below ground employees are trained in mines rescue and are called Active Rescue Trained Persons





MINES RESCUE STATION - SCCL



MRS-RAMAGUNDAM

- This is the Central Mines Rescue Station
- FUNCTIONS:
 - Initial training & refresher training,
 - Serve the mines within 35 kms for emergency needs.
 - Support other rescue rooms in long lasting emergencies.
- STAFF: One Superintendent, Two Instructors & 18 Brigades.

RRRT- KGM & MM

These two Rescue Rooms with refresher training facility are serving Kothagudem and Mandamarri Regions.

- Functions: Imparting refresher training & attending emergencies.
- Staff: 1 Incharge and 10 Brigades.



Rescue Rooms- YLD/MNG/BHPL

- These three Rescue Rooms are serving Yellandu, Manuguru and Bhoopalpalli Areas.
- Functions: Serving as first response during emergencies.
- Staff: One Incharge and 5 Brigades.

RESCUE BRIGADES

- The Rescue Brigades are selected from amongst the rescue trained persons from the mines.
- This enhances their skills and expertise in dealing emergencies and they serve better as First Response when they go back to the mines.
- Rescue Brigades are posted For a minimum of 1 year and a maximum of 5 years.



ACTIVITIES- Training

- Initial Training & Refresher Training in Mines Rescue.
- First Aid Training.
- Training in Use of Self Rescuers.
- Advance training in Hydraulic Rescue Tools, Penumatic Lifting Bags, search & Rescue for dealing disasters like roof falls etc.



ACTIVITIES- Training

- Training in surface fire fighting.
- Organising and Training for company level, National level & International Mines Rescue Competitions.



Activities- Emergencies

- Dealing Mine Fires, influx of gases.
- Re-opening of sealed off areas,
- Rescue of trapped persons during roof falls.
- Rescue during Inundation including dewatering by submersible pumps.



Activities- Emergency.

- Inertisation of mine workings to prevent fires.

CO2 INERTISATION



- Ventilation pressure & quantity survey and application of dynamic pressure balancing technique to prevent and control fires.

Activities- Helping out Mines

- Mine gas analysis & and its interpretation by High Speed Micro Gas Chromatograph installed by SIMTARS.
- Maintenance, repair and calibration of gas detectors.
- Dewatering of old water logged workings by safety boring apparatus.
- Analysis of Blasting fumes for testing of explosives.

Activities- Outside Emergencies

- Dealing surface fires in industries, power plants and villages.
- Rescue during building collapses.
- Dealing major road accidents.





RESPONSE TIME OF RESCUE TEAMS IS
WITHIN 15 MINUTES TO
REACH THE EFFECTED MINE

Equipments to deal underground fires

BREATHING APPARATUS

- BG-4 & PSS BG-4 : 60 Nos.
- BG-174 : 166 Nos.
- Travox-120 : 23 Nos.



RESUSCITATORS:

- **MAXAMAN: 24 Nos.**

(manufactured by Siebe Gorman)



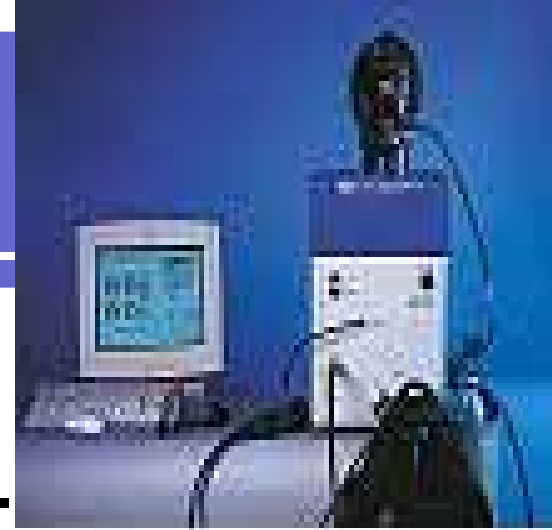
- **OXYLOG : 12 Nos.**

(Oxylog LA mining, Oxylog- 1000
& Oxylog-2000 manufactured by Drager)



Testing Equipments

- Quaestor – III Computerised Testing Equipment for Breathing Apparatus: 1 No.
- Rz-25 Universal Tester : 9 Nos.
- Lung Tester for resuscitators : 7 Nos.
- Oxygen purity testing equipment. : 6 Nos.



Gas Detectors

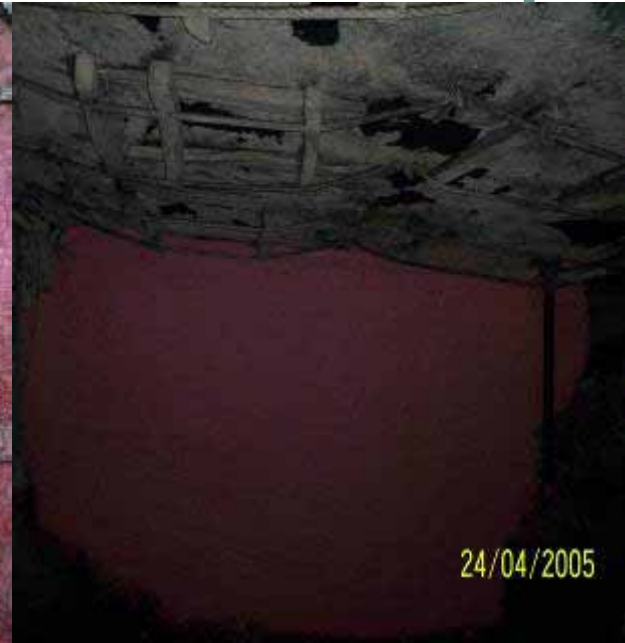


- Multi-Gas : 5
- Methanometers : 50
- Toximeters : 50
- Oxymeters : 50
- Chip Measurement system :5



Isolating Mine Fires

- The mine area under fire are quickly isolated by Rescue Teams using Foam Stoppings-Vent-seals.).
- The foam stoppings are then strengthened by Ash Brick stoppings and later by Explosion proof stoppings if required.



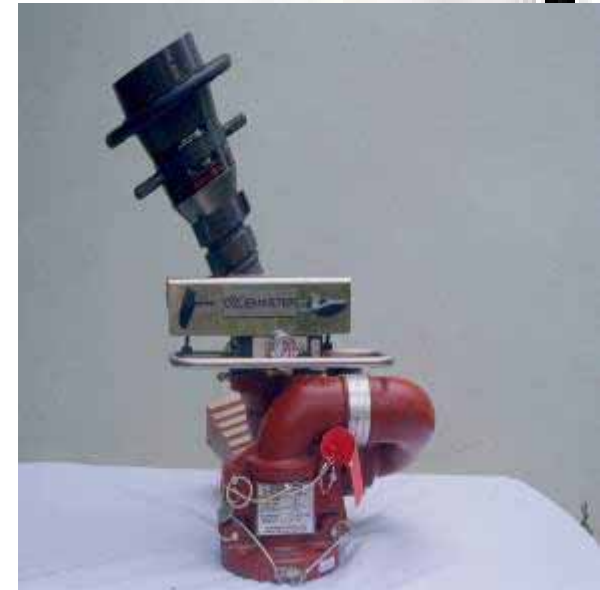
SELF RESCUERS

- 2,300 SCSR of make Drager – 30 min.
- 10,000 more SCSR of 30 & 60 min. being procured.



Equipments to deal surface fires

- Open Circuit Breathing Apparatus
Drager PSS – 500 :6 nos.
- Air line Breathing Apparatus: 6 Nos.
- Nomex Fire suits :12 Nos.
- Different types of Akron Nozzles and Monitors along with hoses.
- High Expansion Foam Pyrocool.



Hydraulic & Pneumatic Rescue Equipments

- Hydraulic Spreaders, Cutters, jacks & rams
- Pneumatic Lifting Bags
- Concrete & Saw Cutters



Submersible Pumps for dealing Inundation



- 60 HP, 1000 GPM, 30 M Head : 3 Nos.
- 110 HP, 2000 GPM, 30 M Head : 3 Nos.
- 100 HP, 1000 GPM, 50 M Head : 3 Nos.
- 130 HP, 1000 GPM, 70 M Head : 3 Nos.
- 215 HP, 1000 GPM, 90 M Head : 1 No.

CENTRIFUGAL

- 240HP,
- 190 HP &
- 125 HP.

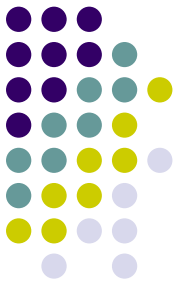


Gas Analysis & Interpretation



- High Speed Micro-Gas Chromatograph installed through SIMTARS
- One more Mobile GC SIMTARS





SEARCH & RESCUE

- Thermal Image Camera.



- Search & Rescue Camera



Up-gradations under process

- 2 Nos. Mobile Nitrogen Generators (Membrane) of 800 CFM for inertisation.
- Liquid Nitrogen Tankers.
- Hydraulic Splitters for breaking rocks for rescue during roof falls.



Future up-gradations planned



- Providing Fall Protection Equipments.
- Modern training gallery with controlled simulations of Fire, Heat & Smoke.



Assistance Required



- Underground communications systems for rescue teams during emergencies. Ex: Inductive communication systems, Personnel Emergency Device,



Assistance Required

- To locate trapped persons under roof falls, open cast slopes etc.
- Faster sealing off mine areas by quick sealing compounds or inflatable stoppings having adequate strength.
- Cooling vests to prevent heat stress and heat strain



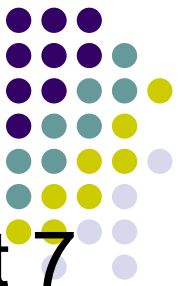


Assistance Required (cont)

- Ground penetrating radars for determining coal rib thickness.
- Escape chambers both against influx of gases and also against inundation. Ex: Cowan, Shairzal chambers.



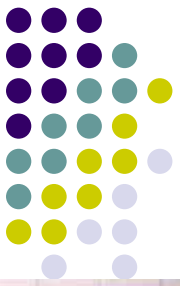
National Rescue Competitions



- SCCL won Overall First 5 Times in the last 7 years of National Mines Rescue Competitions



International Mine Rescue Competitions (IMRC)

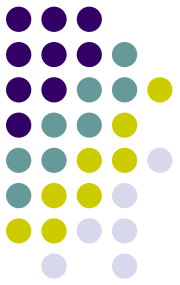


- Participated in 5th IMRC in China in 2006.
 - 2nd in First Aid.
 - 5th in Rescue.
- Participated in 6th IMRC in USA in 2008.
 - Honorable recognition Award





International Mines Rescue Body (IMRB)



- SCCL is the only member of IMRB from India.
- Attended IMRB conference in Johannesburg in 2003 & in Sydney in 2005.





.... Together we are a Winning