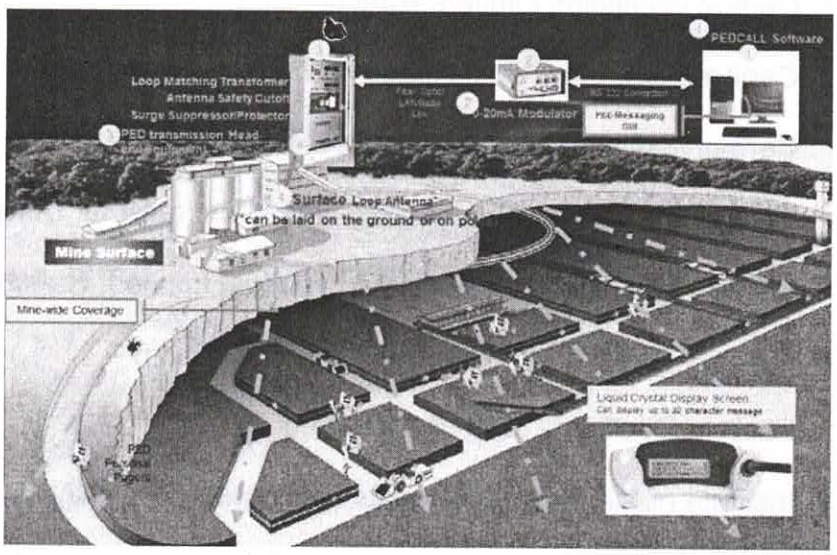
S&T
Annual Report
वार्षिक प्रतिवेदन
2012 – 2013



Integrated Communication System
to Communicate and Locate Miners in Underground Mines

Government of India
Ministry of Coal
New Delhi 110 001

Central Mine Planning & Design Institute Limited
A Miniratna Company
(A Subsidiary of Coal India Limited)
Gondwana Place, Kanke Road, Ranchi 834 031

प्राक्कथन

कोयला उद्योग के सम्पूर्ण विकास के लिये संगठित अनुसंधान 1975 में सरकार का योजनाबद्ध कार्यक्रम ''कोयला विज्ञान एवं प्रौद्योगिकी योजना'' के अपनाने के बाद ही प्रारम्भ हुआ। इसने कोयला गवेषण से लेकर खनन के पश्चात पर्यावर्णिक विषय तक में व्यापक रूप से अनुसंधान एवं विकास के क्रियाकलापों को सक्षम बनाया है।

सेंट्रल माइन प्लानिंग एण्ड डिजाईन इंस्टीच्यूट लिमिटेड (सी एम पी डी आई एल), कोयला विज्ञान एवं प्रौद्योगिकी परियोजना के समन्वयन एवं मॉनीटरिंग के लिये नोडल एजेंसी है।

वर्तमान में कोयला विज्ञान एवं प्रौद्योगिकी कार्यक्रम का संचालन स्थायी वैज्ञानिक अनुसंधान समिति (एस एस आर सी) नामक एक शीर्ष वैज्ञानिक निकाय द्वारा किया जाता है। एस एस आर सी को कोयला अनुसंधान के निम्नलिखित तीन महत्वपूर्ण क्षेत्रों के प्रत्येक क्षेत्र से संबंधित तकनीकी उप समिति द्वारा सहायता प्रदान की जाती है, ये हैं :

- उत्पादन, उत्पादकता एवं सुरक्षा
- कोयला परिष्करण एवं उपयोग
- पर्यावरण एवं पारिस्थितिकी

1975 से कोयला एवं लिग्नाइट उत्पादक कम्पनियों की सक्रिय सहभागिता के साथ कोयला एवं सम्बद्ध उद्योगों से सम्बन्धित राष्ट्रीय अनुसंधान एवं शैक्षणिक संस्थाओं द्वारा कोयला मंत्रालय के विज्ञान एवं प्रौद्योगिकी अनुदान के तहत् वर्तमान में अनुसंधान परियोजनाएँ क्रियान्वित की जा रही हैं। इसके परिणामस्वरूप अभी तक 219 करोड़ रुपये की अनुमानित लागत से 305 परियोजनाएँ पूरी की जा चुकी हैं। कुछ परियोजनाओं की अनुसंधान उपलब्धियों का गवेषण, खनन, पर्यावरण, कोयले की धुलाई, उपयोग प्रौद्योगिकी के क्षेत्र में उद्योग पर महत्वपूर्ण प्रभाव पड़ा है।

इस वार्षिक रिपोर्ट में विवेच्य वर्ष के दौरान 15 चालू परियोजनाएँ एवं 03 पूरी की जा चुकी परियोजनाओं की स्थिति को दर्शाया गया है।

सीएमपीडीआई ने खनन विधि, स्ट्राटा कंट्रोल एवं खान सुरक्षा, कोल बेड मिथेन आदि, 13 चयनित विषयों के संदर्भ में कोयला मंत्रालय के विज्ञान एवं प्रौद्योगिकी अनुदान के लिए ई.ओ.आई. जारी किया है।

आशा है, यह पुस्तिका कोयला तथा इससे सम्बन्धित उद्योगों में लगे सभी अनुसंधान कर्मियों, माइन प्लानरों/ डिजाइनरों के लिये उपयोगी होगी।

भविष्य में संस्करण को समृद्ध बनाने के लिये प्रस्तुति एवं विषयवस्तु के प्रकाशन में सुधार लाने हेतु आपके महत्वपूर्ण सुझावों का स्वागत है।

(ए. के. देबनाथ)
अध्यक्ष-सह-प्रबंध निदेशक
सीएमपीडीआई लि.

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Production, Productivity & Safety

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Field : Production, Productivity & Safety Project Code : MT(EoI)/158

1.	**Name of the Project**	:	**Integrated communication system to communicate and locate trapped underground miners**
2.	Date of Start	:	September 2010
3.	Scheduled date of Completion	:	August 2013
4.	Implementing Agency	:	AdCept Technologies Private Limited, Kolkata
5.	Sub –implementing Agency		CMPDIL , Ranchi
6.	Project leader /Co-ordinator	:	Shri Soumya K. De, AdCept Technologies Private Limited, Kolkata
7.	Total Approved Cost	:	Rs. 459.59 lakh For AdCept – Rs. 407.95 lakh For CMPDIL Rs. 51.64 lakh

DESCRIPTION OF THE PROJECT

8. Objectives :

The objective of this project is to introduce communication systems that would (i) be able to rescue workforce in case of an underground accident and be able to communicate from surface to underground miners and (ii) to locate/track miners involved in the incidence, besides, providing communication for day to day activities in underground mines. The project work will be conducted at Bansgarha Seam, Central Saunda Colliery of Central Coalfields Limited (CCL).

The complete communication System will be based on:-

1. Through-the earth (TTE) one way messaging system with all communication infrastructure on the surface, including the antenna

2. Tracking system with location readers deployed in the underground

3. Integration of TTE messaging system & location tracking system

9. Status as on 31.03.2013 :

Through-The-Earth (TTE) messaging and also two-way wireless communication systems have been developed and installed successfully at Bhurkunda Colliery of CCL. The integrated system is now being used with digital wireless telephones in Bhurkunda mine. Now one can make a

1.	**Name of the Project**	:	**Development of Self Advancing (mobile) Goaf Edge Support (SAGES) for Depillaring Operations in Underground Coal Mines**
2.	Date of Start	:	Sep 2010
3.	Scheduled date of completion	:	Mar 2014/June 2013/Dec 2012
4.	Implementing Agency	:	ISM, Dhanbad
5.	Sub-Implementing Agency	:	M/s Jaya Bharat Equipment Pvt. Ltd. (JBEPL), Hyderabad
6.	Project Leader/Co-ordinator	:	Prof. (Dr.) Upendra K. Singh, Deptt. of Mining Engineering, ISM, Dhanbad Shri NVN Reddy, Director, M/s JBEPL, Hyderabad
7.	Total Approved Cost	:	Rs. 197.75 Lakh For JBEPL – 135.65 lakh For ISM – 62.10 lakh

DESCRIPTION OF THE PROJECT

8. Objectives :

Design and develop Self Advancing Goaf Edge Support (SAGES) of Medium Duty: 2 x 200T load capacities for depillaring operations in underground coal mines.

9. Status as on 31.03.2013 :

Design and fabrication of two (2) nos of self advancing (mobile) goaf edge supports(SAGES) have already been developed using Finite Element Modeling (FEM) analysis by M/s JBEPL in association with ISM, Dhanbad. Field trial is under progress at Bastacola Colliery, BCCL. Design and fabrication of remaining four SAGES are being done with some minor modifications as revealed from the field trials of two SAGES.

10. Slippage, if any : Delay in approval for field trial from DGMS.

1.	**Name of the Project**	:	**Development of Software for Prediction of Subsidence by 3D Numerical Modelling for SCCL Mines**
2.	Date of Start	:	Aug 2011
3.	Scheduled date of completion	:	Jul 2014
4.	Implementing Agency	:	Anna University, Chennai
5.	Sub-Implementing Agency	:	SCCL
6.	Project Leader/Co-ordinator	:	Prof. (Dr.) L. Ajay Kumar
7.	Total Approved Cost	:	Rs. 53.80 Lakh

DESCRIPTION OF THE PROJECT

8. Objectives :

(i) To develop a subsidence prediction model

(ii) To decide the size & shape of protective pillars to safeguard against damage to surface structures and to develop the concept of 'Non-Effective Width' for planning extraction below ground without any effects of subsidence on surface.

(iii) To develop software for determination of subsidence parameters based on preliminary survey data of drill – log and plan layout information for new or future mines.

(iv) Development of user interface software for prediction of subsidence parameters by 3D numerical modeling technique.

(v) Training of SCCL personnel on using the developed software.

9. Status as on 31.03.2013 :

Subsidence data (extraction thickness, depth, width to depth ratio, method of working, RQD, percentage of extraction etc.) from 60 panels of 34 mines of SCCL were collected and analyzed for subsidence surveys. A comparative study has been done between the observed & theoretically calculated subsidence values and error percentage of the theoretical values were found in the range of 60 - 70% against the observed values. Subsidence surveys conducted at Mandamaari and Srirampur Areas of SCCL for defining influencing parameters. Basic 2D subsidence module was developed. Development of 3D software is in progress. Reflector less automatic target recognition total station has been procured.

Field : Production, Productivity & Safety — Project Code : MT/161

1.	**Name of the Project**	:	**Development of Customized Organic Coatings for Corrosion Protection of Special Mining Equipments at Neyveli Lignite Mines, NLC, Neyveli.**
2.	Date of Start	:	Aug 2011
3.	Scheduled date of completion	:	Jul 2014
4.	Implementing Agency	:	NLC, Neyveli
5.	Sub-Implementing Agency	:	CECRI, Karaikudi
6.	Project Co-ordinator	:	Dr. S. Santhanam, GM/CARD, NLC, Neyveli
7.	Project Leader	:	Sri P. Veerabalu, DGM, NLC, Neyveli
8.	Total Approved Cost	:	Rs. 46.41 Lakh

DESCRIPTION OF THE PROJECT

9. Objectives :

NLC

(i) To find out the root causes for the problem

(ii) To assess corrosive environment and the corrosion process mechanisms

(iii) To develop appropriate erosion – corrosion models

(iv) To develop suitable coating materials for critical SME components with proper methodology in association with CECRI.

(v) Evaluation of the Corrosion Coatings suggested by CECRI

CECRI

(i) To develop an organic nano-coating for corrosion prevention in the above areas of mines based on the findings in the preliminary studies.

(ii) To apply and evaluate the performance and redesign the coating composites to enhance the life of the components.

Field : Production, Productivity & Safety Project Code : MT(EoI)/162

1.	**Name of the Project**	:	**Development of Tele robotics and Remote Operation Technology for Underground Coal Mines.**
2.	Date of Start	:	Sep 2012
3.	Scheduled date of completion	:	Dec 2015
4.	Implementing Agency	:	(a) CMERI, Durgapur (b) CIMFR, Dhanbad
5.	Sub-Implementing Agency	:	CMPDIL, Ranchi
6.	Project Co-ordinators	:	1. Dr. S. Majumder, CMERI, Durgapur 2. Dr. R. Singh, CIMFR, Dhanbad
7.	Project Leaders	:	1. Dr. A. Maity, CIMFR, Dhanbad 2. Dr. P. K. Mandal & Dr. P. K. Mishra 3. General Manager (ME), CMPDI
8.	Total Approved Cost	:	Rs. 440.12 Lakh For CMERI – Rs. 251.57 lakh For CIMFR – Rs. 125.55 lakh For CMPDI – Rs. 63.00 lakh

DESCRIPTION OF THE PROJECT

9. Objectives :

To develop mobile robot technology for tele-operation for on-line monitoring of mine environment, roof strata conditions including automated mapping on mine progress. The proposed on-line monitoring system will provide various environmental and strata control parameters from an underground coal mine to take immediate steps by the mine management in case of any abnormalities observed during the monitoring period.

10. Status as on 31.03.2013 :

Literature survey and basic data collection from mine completed. Detailed system analysis for finalization of system and design of 3D CAD models development is completed. Procurement of equipment is under progress.

1.	**Name of the Project**	:	**Enhancing Life of De-watering Pipes in Coal/Lignite Mines by Prevention of Erosion-Corrosion with Nano Crystalline Surface Engineering Treatments.**
2.	Date of Start	:	Sep 2012
3.	Scheduled date of completion	:	Sep 2016
4.	Implementing Agency	:	(a) NLC, Neyveli (b) NITT, Tiruchirapalli
5.	Project Co-ordinators	:	1. Sri S. Chokkuvel Murugan, GM, NLC 2. Dr. S. Natarajan, NITT
6.	Project Leaders	:	1. Sri M. Kumarasamy, CM/Mechanical, NLC 2. Dr. S. P. Kumaresh Babu, NITT
7.	Total Approved Cost	:	Rs. 293.99 Lakh For NLC – Rs. 78.68 lakh For NITT – Rs. 215.31 lakh

DESCRIPTION OF THE PROJECT

8. Objectives :

NLC

(i) To establish the basic causes for the erosion-corrosion of pipelines in mines.

(ii) To assess corrosive environment and the corrosion process mechanisms.

(iii) To develop appropriate erosion-corrosion models for different environment and their correlation.

(iv) To evolve suitable materials for surface treatment for critical portions of dewatering pipes with proper methodology in association with NITT.

(v) Field Evaluation of the measures and cost economics.

Field : Production, Productivity & Safety — Project Code : MT/164

1.	**Name of the Project**	:	**Blast design and fragmentation control-key to productivity.**
2.	Date of Start	:	Jan 2013
3.	Scheduled date of completion	:	Dec 2015
4.	Implementing Agency	:	CIMFR, Dhanbad
5.	Project Leaders/Co-ordinators	:	Sri P. K. Singh, CIMFR, Dhanbad
6.	Total Approved Cost	:	Rs. 303.86 Lakh

DESCRIPTION OF THE PROJECT

7. Objectives :

The objective of the project is develop procedures and criteria for selection of explosives, initiators and appropriate blast designs and finally integrated blast design guidelines for improving productivity in the opencast mines.

8. Status as on 31.03.2013 :

Experimental sites were finalized. Indents have been submitted for procurement of the equipment.

9. Slippage, if any : N. A.

Field : Production, Productivity & Safety Project Code : CE (EoI)/30

1.	**Name of the Project**	:	**Shale Gas Potentiality Evaluation of Damodar Basin of India**
2.	Date of Start	:	Dec 2012
3.	Scheduled date of completion	:	Dec 2015
4.	Implementing Agency	:	NGRI, Hyderabad
5.	Sub-Implementing Agency	:	CIMFR, Dhanbad & CMPDI, Ranchi
6.	Project Leader/Co-ordinator	:	1. Dr. Mrinal K.Sen, Director, NGRI 2. Dr. Vinod Atmaram Mendhe, Principal Scientist, CIMFR 3. GM/Dy. GM(CBM), CMPDI
7.	Total Approved Cost	:	Rs. 1686.84 Lakh For NGRI – Rs. 462.59 Lakh For CIMFR – Rs. 169.95 Lakh For CMPDI – Rs. 1054.30 Lakh

DESCRIPTION OF THE PROJECT

8. Objectives :

- CMPDI, Ranchi NGRI, Hyderabad and CIMFR, Dhanbad will evaluate Damodar basin of India for their shale gas potentiality through integrated geophysical, geological, geochemical and petrophysical investigations.
- In the first phase, study will be carried out for shales associated with Damodar basin.
- Near surface group of NGRI will be taking up 2D/3D (9-Component) seismic surveys and other geophysical methods to delineate Shale Beds and associated structural features in Damodar basin. Based on geophysical study, area will be selected for the borehole drilling.
- In first phase it is plan to study two to five bore hole from Damodar basin. Number of shale samples from each bore hole will depend on the thickness of the shale. Core library will be maintained at NGRI and the core will be available for any academic interest.

Coal Beneficiation & Utilisation

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Field : Coal Beneficiation — Project Code : CP/44

1.	**Name of the Project**	:	**Development of Tribo-electrostatic Separator for Beneficiation of High Ash Indian Coal Fines.**
2.	Date of Start	:	Aug 2011
3.	Scheduled date of completion	:	Jan 2014
4.	Implementing Agency	:	IMMT, Bhubaneswar
5.	Project Leader/Co-ordinator	:	Dr. R. K. Dwari, Scientist Sri PSR Reddy, HoD, MPD, IIMT, Bhubaneswar
6.	Total Approved Cost	:	Rs. 47.67 Lakh

DESCRIPTION OF THE PROJECT

7. Objectives :

The main objective of this project is to develop a tribo-electrostatic separator and to study the design characteristics for beneficiation of high ash Indian coking coal at finer sizes to reduce the ash content.

8. Status as on 31.03.2013 :

The tribo-electrostatic separator is designed and constructed. Work is under progress on the instrumentation of the equipment. Major equipments have been indented and under procurement stage. Climatic room have been constructed to maintain the humidity of atmosphere and to study its effect on electrostatic separation. Two samples one non coking coal (Hingula mines, Talcher) and one coking coal (Jharia coal) washery middling has been collected to test in the separator. The characterization studies of above two samples were carried out and preparation of feed material for the Tribo-electrostatic separator is going on. Samples from BCCL are yet to be collected.

9. Slippage, if any :

Samples are yet to be received from BCCL.

Field : Coal Beneficiation — Project Code : CP/45

1.	**Name of the Project**	:	**Design & development of "Coal Winnowing System" for dry Beneficiation of coal based on CFD modeling & simulation.**
2.	Date of Start	:	Aug 2011
3.	Scheduled date of completion	:	Jul 2013
4.	Implementing Agency	:	CIMFR, Nagpur, Unit – II
5.	Sub-implementing Agency	:	NCL, Pune
6.	Project Leader/Co-ordinator	:	Mr. Devendra Kumar Sakhre, Sr. Scientist CIMFR, Nagpur Unit, Nagpur
7.	Total Approved Cost	:	Rs. 181.4 Lakh For CIMFR, Nagpur – Rs. 163.78 Lakh For NCL, Pune – Rs. 17.62 Lakh

DESCRIPTION OF THE PROJECT

8. Objectives :

(a) Design & development of new coal beneficiation equipment for dry coal beneficiation based on winnowing technique.

(b) Design, fabrication & testing of system based on CFD simulation software's and validation of all technical parameters.

9. Status as on 31.03.2013 :

6.025 Te of Non-coking ROM coal samples collected from Durgapur OCP, Chandrapur area, WCL. The float & sink test (Washability studies) of the screened coal has been carried out. 3 experiments coal winnowing machine has been conducted with 50-25 mm and 25-13 mm size fractions of coal.

10. Slippage, if any : N.A.

1.	**Name of the Project**	:	**Design & Development of Truck Mounted Mobile Coal Sampler for Instant Coal Ash & Moisture Analyzer at Site from Railway Wagon/Truck.**
2.	Date of Start	:	Aug 2011
3.	Scheduled date of completion	:	Oct 2013 / Apr 2013
4.	Implementing Agency	:	CIMFR, Dhanbad
5.	Sub-implementing Agency	:	1. M/s. Pranay Enterprises, Hyderabad 2. SCCL, Kothagudem
6.	Project Leader/Co-ordinator	:	Mr. Sudhir Kumar Kashyap, Scientist, CIMFR, Dhanbad
7.	Total Approved Cost	:	Rs. 167.60 Lakh

DESCRIPTION OF THE PROJECT

8. Objectives :

To design & develop a truck mounted mobile coal sampler for instant coal ash & moisture analyzer at site from railway wagon/truck.

9. Status as on 31.03.2013 :

Literature review including technical survey of nuclear technique method completed. Purchase of equipment is in process. However, there is a delay in identifying the suppliers of dual -gamma coal sampler.

10. Slippage, if any :

Due to delay in procurement of equipment, their statutory testing & approval from M/s ECIL, Hyderabad.

11. Action Plan for 2013-14 :

Sl. No.	Activity	Date of start	Date of completion
1	Mine coal samples would be collected from SCCL, Hyderabad and its analysis	Apr 2013	Oct 2013
2.	Project Completion report of Phase-1 study	Sep 2013	Oct 2013

9. Status as on 31.03.2013 :

Global tender floated for procurement of coal -to-oil pilot plant. Three parties have Global tender floated for procurement of coal -to-oil pilot plant. Three parties have responded. Technical evaluation of bids was done by duly constituted technical sub-committee by CIMFR. Two firms have been technically qualified for the CTL-PDU. A continuous experimental run of 120 hr in the existing reactor was conducted on iron-cobalt mixed metal catalysts and appreciable success for liquid production is achieved. Experiment was conducted on synthetic gas mixture simulating the coal gasification product. Gas and liquid analyses are in progress to quantify the yield and selectivity of the catalyst.

10. Slippage, if any :

Due to non availability of competent firms for the CTL-PDU, installation of the PDU is delayed.

11. Action Plan for 2013-14 :

Sl. No.	Activity	Date of start	Date of completion
1.	Procurement of CTL PDU	Jan 2010	Continuing
2.	Bulk preparation of catalyst	Jun 2013	Continuing
3.	Testing of catalysts in existing facility	Jan 2010	Continuing

Environment & Ecology

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1.	**Name of the Project**	:	**Development of Methodology for Estimation of Greenhouse Gas (GHG) Emissions in Mine Fire Areas and their Mitigation through Terrestrial Sequestration.**
2.	Date of start	:	Feb 2009
3.	Scheduled date of completion	:	Jun 2013/Nov 2012
4.	Implementing Agency	:	CIMFR, Dhanbad
5.	Sub-Implementing Agency	:	BHU, Varanasi
6.	Project Leader	:	Dr. Siddarth Singh, Scientist, CIMFR, Dhanbad
7.	Project Co-ordinators	:	Dr. A. K. Singh, Scientist, CIMFR, Dhanbad Dr. B. K. Tewary, Scientist, CIMFR, Dhanbad
8.	Total Approved Cost	:	Rs. 354.49 lakh For CIMFR : Rs. 341.77 lakh For CMPDI : Rs. 12.72 lakh

DESCRIPTION OF THE PROJECT

9. Objectives :

(i) To estimate Greenhouse Gases (CO_2, CH_4 & N_2O) emission from coal mine fire areas, inventorization and its temporal and spatial dispersion at ground level.

(ii) To estimate in real time the load of combustion aerosol (black carbon, sulphates and nitrate) emissions from mine fire area.

(iii) To quantify the existing greenhouse gases sinks using space born data and estimate its carbon sequestration potential.

(iv) To develop GHG's Emission Factor for coal mine fires.

(v) To standardize terrestrial CO_2 sink management practices under Landuse, Landuse Change and Forestry and facilitate future emission trading.

10. Status as on 31.03.2013 :

Installation of Aerosol Spectrometer & Aethalometer in the laboratory and colliery has been completed. Around 24000 data sets have been collected using both the instruments. Design of the system which collect Green House Gas being emitted from coal mine fire has been finalized. Chemical parameters of soil including anions, cations, organic carbon etc have been completed. Analysis of physical parameters of soil of dump and other wastelands in Jharia & Raniganj coalfields have also been completed. Soil carbon pool of Raniganj coalfields has been studied in detail for various land uses, a pre-requisite for the feasibility study of CDM (Clean Development Mechanism). Gas Chromotograph has been procured. Most of equipment except CO_2 analyzer has been installed.

11. Slippage, if any : Delay in procurement of equipment and Carbon Credit aspects.

12. Action Plan for 2013-14:

Sl. No.	Activity	Date of start	Date of completion
1.	Literature review, collection of maps and other relevant documents from BCCL and ECL documents from BCCL and ECL.	Apr 2013	Jun 2013
2.	Characterization and quantification of GHG sink from existing land use pattern through suitable RS data and ground truth realization	Apr 2013	May 2013
3.	Meeting of the implementing agencies to review the progress achieved	May 2013	Jun 2013
4.	Project Completion Report Preparation	Jan 2013	Jun 2013

S&T Completed Projects during 2012-13

S&T Annual Report

2012-13

Field : Production, Productivity & Safety — Project Code : CE/29

1.	**Name of the Project**	:	**Development and Utilization of Coal Bed Recovery Process for CO_2 Sequestration**
2.	Date of Start	:	Jan 2010
3.	Scheduled date of completion	:	Dec 2012
4.	Implementing Agency	:	ISM, Dhanbad
5.	Project Leader	:	Dr. Keka Ojha, ISM, Dhanbad
6.	Total Approved Cost	:	Rs. 26.98 Lakh

DESCRIPTION OF THE PROJECT

7. Objectives :

The major objectives of the investigations are :

- Collection of CBM samples from nearby CBM fields and their characterization.
- To study the adsorption-desorption isotherm of methane and CO_2 with varying compositions at different pressure and temperature conditions. Desorption behavior of methane is the representation of primary recovery of CBM. Investigations will be carried out at dry as well as moist conditions as many Indian CBM reservoirs have high moisture content and required much study for efficient and economic recovery of methane from those.
- Experimentation on recovery of CBM by CO_2 injection with variable pressure, temperature, gas composition and flow rate conditions.
- Modeling and simulation of the system to optimize the CBM recovery

8. Work Done :

- **Collection of Samples :** Coal samples were collected from 4 blocks of Jharkhand, West Bengal and Singareni coalfields for evaluation of Coalbed methane potential, petrophysical properties and CO_2 sequestration.
- **Characterization :** The samples were characterized for chemical composition, petrographic analysis and calorific value. Correlations are made for variation of gas content and vitrinite

1.	**Name of the Project**	:	**Treatment of Acid Mine Drainage Generated in Indian Coal Mines Using Low Cost Material.**
2.	Date of Start	:	Jan 2010
3.	Scheduled date of Completion	:	Dec 2012
4.	Implementing Agency	:	CIMFR, Dhanbad
5.	Project Leader/Co-ordinator	:	Dr. (Mrs.) Bably Prasad / Dr. B. K. Tewary, Scientist, CIMFR
6.	Approved Cost	:	Rs. 44.17 Lakh

DESCRIPTION OF THE PROJECT

7. Objectives :

To investigate into treatment of acid mine water generated in Indian coalmines using low cost material, the objectives have been made as follows.

- Characterization of acid mine water of few Indian coal mines (underground and opencast)
- Conversion of fly ash in to zeolitic mineral to be used for treatment of acid mine water.
- Treatment of acid mine water by fly ash zeolites.
- Evaluation of effectiveness and cost for treatment of acid mine water by fly ash zeolite.

8. Work Done

(i) Collection of acid mine drainage from few coalmines of different mining areas and from thermal power plants.

(ii) Characterization of acid mine water with respect to Cations and Anions.

(iii) Preparation of Zeolitic material from fly ash at laboratory scale, using different techniques.

(iv) Treatment of acid mine water by fly ash Zeolite material.

(v) Study of different factors such as pH, concentration of cations and anions.

1.	**Name of the Project**	:	**Emissions from Coal Based Industries – Development of Predictive Models.**
2.	Date of start	:	Jan 2010
3.	Scheduled date of completion	:	Dec 2012
4.	Implementing Agency	:	NEIST, Jorhat
5.	Project Leader / Co-ordinator	:	Dr. Puja Khare, Scientist, NEIST, Jorhat Dr. B. P. Baruah, Head, Coal Chemistry Divn., NEIST, Jorhat
6.	Total Approved Cost	:	Rs. 82.46 Lakh

DESCRIPTION OF THE PROJECT

7. Objectives :

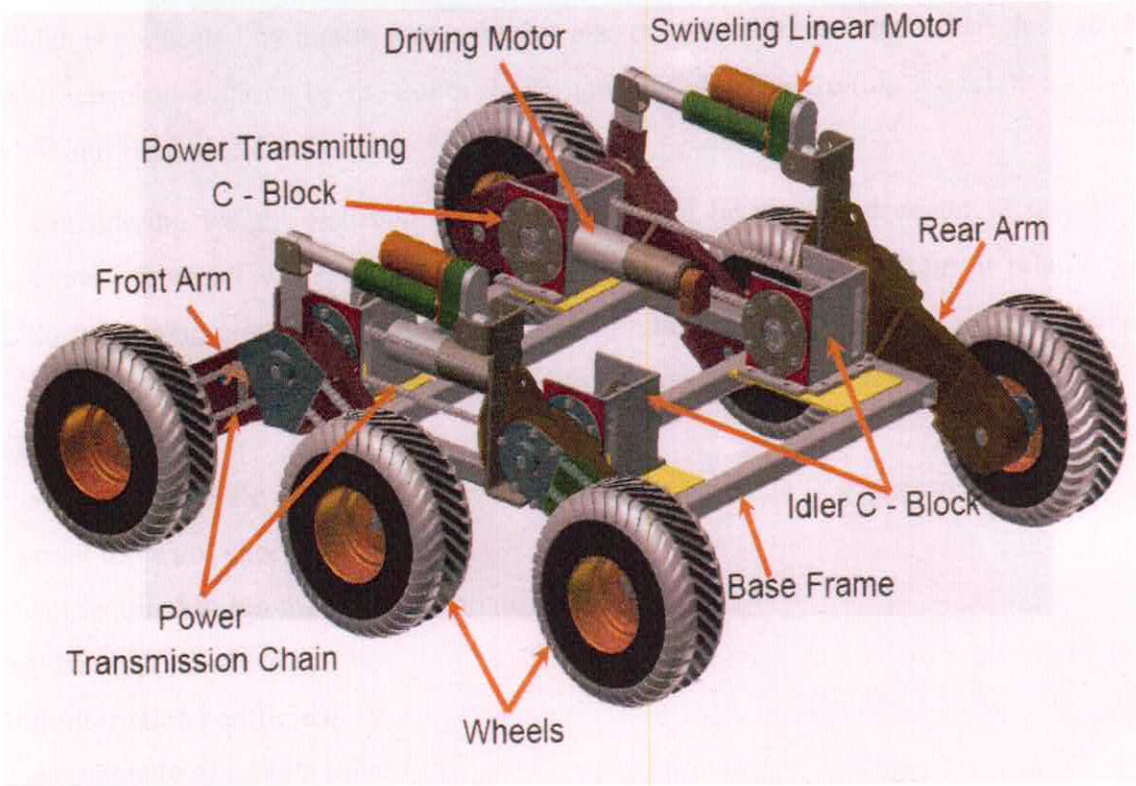
- To quantify the particulate matter (SPM, $PM_{2.5}$ and PM_{10}) and toxic gas emissions from coal mining and utilization industries.
- Chemical characterization and mass size distribution of particulate matter ($PM_{2.5}$ and PM_{10}) from coal based industries.
- Evolving relationship between the coal quality parameters emissions.
- Identification of the factors that contribute towards emission of particulates (SPM, $PM_{2.5}$ and PM_{10}) and toxic gases depending upon the type of mining methodologies and utilization techniques.
- Emission inventory for coal based industries.
- Modeling and suggestive measures to regulate the emission from coal mining and utilization industries like coke ovens, mining etc.

8. Work Done :

(i) Purchase of equipment, consumable etc.

(ii) Site selection and installation of instruments/equipment, setting up of the monitoring houses for different field sites.

(iii) Systematic investigation of toxic gases, particulate matter and hazardous air pollutants from coal-based industries.



3D CAD view of General Assembly of the Robot along with different parts — MT(EoI) / 162

Lab Scale Coal Winnowing system developed under S&t Grant of MoC — CP / 45