



# CFRI NEWSLETTER



**Vol. 5**

**No. 1**

**Quarterly Issue**

**Jan. -March 2005**

Established in November 1946, Central Fuel Research Institute is a unique Institute of its kind in India under CSIR, New Delhi to conduct research in different areas of Fuel Science and Technology with emphasis on coal and lignite.

**Mission:** Enhance the position of the Institute as a premier R&D centre for technology development and transfer by forging strategic alliance with other agencies and continuously strive for excellence in the area of potential expertise for generation of basic knowledge, innovation, and advanced concepts in science and technology for economic, efficient, and environmentally safe energy management.

## EXTRAPOLATORY WASHABILITY STUDIES ON CHAR FROM SPONGE IRON PLANT (*Monnet Ispat Ltd., New Delhi*)

The objective of the project is to study the possibility on washing potentiality of CHAR from Sponge Iron Plant. The char samples having size 18-4 mm and 4-0.5 mm were subjected to float and sink tests and less than 0.5 mm size was characterized for ash and moisture content. Float and sink test of 4 mm-0.5 mm showed erratic results. It was observed from the washability data of 18-4 mm size that substantial quantity (about 50 percent of the feed) having ash content about 90 percent may be discarded by judicious upgradation of the char.

## BENEFICIATION OF COAL SLURRY FROM NANDAN WASHERY BY FROTH FLOTATION TECHNIQUE (*Arpana Enterprises, Vidarbha Industries Ltd., Nagpur*)

The objective of the project is to study the effect of flotation on the coal fines from Nandan Washery for beneficiation. Size analysis of Nandan Washery coal fines shows that the sample contains 2.7% and 9.5% oversize at 3 and 1 mm respectively. It is observed that a yield of 31.4% with 14.4% ash content can be achieved with tailings of 40.6 % ash and 68.6 % yield, if the coal is treated at 1 mm. Similarly, if the coal is screened at 0.5 mm and test conducted, a yield of 52.4% with 15% ash can be achieved whereas the ash of tailings was around 52.4% at a yield of 47.6%. The results indicate that the flotation technique can be utilized for beneficiation of coal fines from Nandan Washery.

## COAL PETROLOGY: PRESENT ACTIVITIES

Coal Petrology section is mainly engaged in execution of different R&D projects with particular reference to the application of coal petrology in the areas of coal carbonisation, coal preparation, nature and behaviour of non-coking coals/power coals from the utilisation point of view. Microscopic investigations on coke/char are also carried as

and when necessary. The application of the study is an integral part of the R&D efforts, which is essentially required for the execution of the various S&T projects undertaken by different divisions of the Institute, as also for providing technical aid to external organisations/ industries. Large number of samples were studied in connection with the different ongoing projects. Besides the above work, microscopic studies of coke/jhama/heat affected coal/char samples are also carried out in connection with different projects.

## COAL QUALITY ASSESSMENT: CFRI NAGPUR

Studies were carried out on coal quality assessment of borehole coal core from different areas drilled by agencies like CMPDI at – 1. Wardha Valley Coalfields Blocks (Borda Extn, Mugoli, Niljai, Ukni), 2. Mand Raigarh Coalfields (Pelma block, 3. Korba Coalfields, Dipride of Kulda, Garjanbahal block), 4. IB Valley (West Extension of Gianmol Block). Also qualitative and detailed analysis of coal samples from private parties like Indorama, Raymond, Maharashtra State Electricity Board, Gujrat Electricity, Western Coalfield Ltd., MBL, CCO etc. were carried out .

## PAPERS PUBLISHED

P. Singh, N. Choudhury, A. Sarkar, P. Sarkar and T. B. Das, Reactivity assessment of non-coking coal by oxidative thermogravimetric studies, *Indian Journal of Chemical Technology*, Vol. 12, January 2005, pp. 30-34.

## CHAPTER IN BOOK

S.K. Bharati, T.N. More, S.B. Jogdand and S.T. Tilak (2004) Fungal airspora over a polluted environment of garbage disposal plant, Pune. In A.J. Solomon Raju (Ed.) Changing

Trends in Pollen Spore Research (Advances in Pollen spore research vol. XXII.) published by Today & Tomorrow Printers and Publishers, pp 51-60.

### PAPERS IN SEMINAR

1. S.K. Bharati, S.K. Thakur, Joshy George, Vivek Singh, Krishangi Kumari, R.C. Tripathi, L.L.Naik and P.S.M. Tripathi "Aerobiological studies on the environment of coalfields/coal based industries in and around Jharia" at 13<sup>th</sup> National Conference on Aerobiology Organised by Institute of Science, Nagpur from 31<sup>st</sup> January to 2<sup>nd</sup> February 2005.
2. A.K. Sinha, N.K. Srivastava L.C. Ram, S.K. Jha, R.C.Tripathi, K.C. Gupta, N.K. Vaishya and M.K. Singh "Krishi evam vaniki mein udan rakh ka paryahitashi upyog", Antarashtriyai Vaigyanik Sangosthi Paryavaran, Swasthya Evam Soochana Prodyogiki; Nutan Sopan (HIMAVAS-2005, in Hindi) at ITRC Lucknow ,28 Feb.-2 March 2005.
3. L.C. Ram, N. K. Srivastava, A. K. Sinha and S. K. Jha, "Krishi evam vaniki: Udan rakh ka ek paryahitashi samadhan" in Workshop-cum-Sangosthi on Damodar Ghati Kshetra Me Paryavaran Ki Chunouti, Samasyayen evam Samadhan (in Hindi) during 22 – 23 March,2005 organised by DVC Training Institute, Chandrapura, Bokaro, Jharkhand, pp.48-64.
4. N.K. Srivastava, L.C. Ram and A. K. Sinha "Koylanchal mein jaiv vividhata sanrakhan evam tatiya vanaspatiyon ki bhumika" Ibid, pp. 65-71.
5. L.K. Sahoo and Seema A. Topno, Energy audit and conservation prospects in coal based thermal power plants, Energy Conservation in Thermal Power Plants, DVC Training Institute, Chandrapura, Bokaro, 30-31 March 2005.

### INVITED TALK

Dr L. C. Ram, Scientist E-II gave an invited talk on "Sustainable Bulk Use of TPP Ash in Agro-forestry" in the Seminar on Environmental Sustainable Development to Power Plant held at NTPC on 25-02-2005 at NTPC, NOIDA, G B Nagar, U.P.

### LECTURE

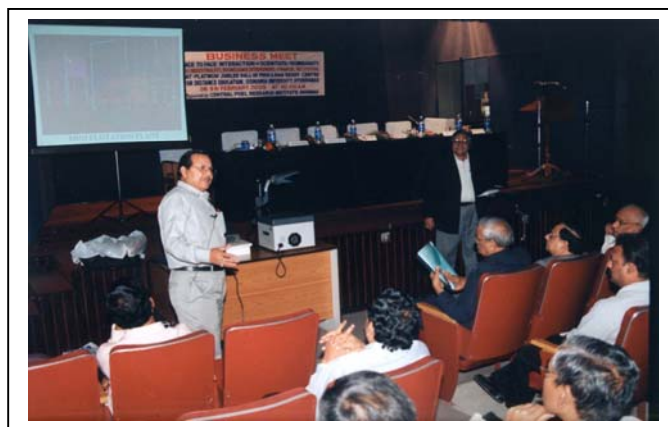
Shri Gopal Sane, Consultant in Waste Management, Delhi delivered a lecture on 'Multifacet Applications of Biosantiser' on 21.03.05.

### REPUBLIC DAY CELEBRATION

Fifty Sixth Republic Day was celebrated with full of zest on 26<sup>th</sup> January 2005. On this occasion Dr Kalyan Sen, Director, CFRI hoisted the national flag in front of main building. National anthem was sung by the all attending the ceremony. He delivered the speech and highlighted the achievements of the Institute during last one year. As a symbol of happiness, sweets were distributed among the children and others.

### CFRI BUSINESS MEET-2005

A business meet was organised on 9<sup>th</sup> Feb. 2005 at Platinum Jubilee Hall of Prof. G. Rama Reddy Centre for Distance Education, Osmania University, Hyderabad. The main purpose of this meet was to bring the businessmen, industrialists, scientists, financial institutions, technologists, and entrepreneurs at one platform for face to face interaction. This helped CFRI scientists to understand their problems. There were presentations by CFRI scientists on general profile of CFRI, coal preparation, coal carbonization, environmental management and special testing facilities, etc.



A view of Business Meet-2005 on 09.02.05

### WORKSHOP ON HRCOKE-2005

A National Workshop on Heat Recovery Coke Oven (HRCOKE-2005) was organized during 26-28 February 2005. The purpose of the workshop was to discuss state of art in coke making in present context with special reference to heat recovery coke ovens. A cheap energy efficient environment friendly alternative of coke making. Fifty two delegates participated in this workshop from different parts of the country. This workshop covered topics like national and international scenario of coke making, mechanism of carbonization, coke making technology (Heat Recovery), refractories and environmental aspects. Dr S. K. Gupta, Chairman, Eco-Coke, Bangalore and Shri B. K. Singh, Director, Coke Plant, Tata Steel, Jamshedpur delivered the lectures besides the scientists from CFRI, Dhanbad.

### 1<sup>st</sup> INDIAN MINERAL CONGRESS & EXHIBITION

ISM Alumni Association organised 1<sup>st</sup> Indian Mineral Congress and Exhibition at Indian School of Mines, Dhanbad during 27 Feb. to 1<sup>st</sup> March 2005. The exhibition was inaugurated by Shri Bhaskar Bhattacharya, DGMS, Dhanbad. In this exhibition CFRI participated with its stall.

### NATIONAL SCIENCE DAY

Dr Nabiullah, Scientist 'F', Central Mining Research Institute, Dhanbad delivered National Science Day Lecture on

"Requirement of Energy in our Country and its Future" on the 28 February 2005. National Science Day is celebrated all over the country on 28 February. On this very day the research paper on 'Raman's Effect' was published. For this discovery Sir (Prof.) C.V. Raman was awarded Noble prize in Physics in the year 1930.

### NEW PROJECTS

1. Assessing the Quality and Nature of Coal for Coke making from the Data supplied by Durgapur Projects Ltd. – Consultancy project awarded by Durgapur Projects Ltd., Durgapur.
2. Characterisation of Coal Samples for Coal Bed Methane – Project sponsored by Central Mining Research Institute, Dhanbad.
3. Design, Drawing, Erection and Commissioning of Non-recovery Coke Ovens for M/s Tycoon Industries Pvt. Ltd., Cuttack.
4. Pushers type Non-recovery Coke Oven for ACM Fuels Pvt. Ltd. Dhanbad.

### VISIT OF HIGH POWER COMMITTEE

A high level committee led by Dr G. Tyagrajan visited CFRI during 12-13 Jan. 2005 to discuss on Consolidation of Core Competencies of CMRI and CFRI, Dhanbad. The other members of the team were Dr. R. Natarajan, Shri A. K. Verma and Shri O. P. Agarwal. In this meeting Dr. Kalyan Sen, Director, CFRI and all Heads of Division participated.

### PARTICIPATION IN TECHNOLOGY EXHIBITION

A technology exhibition on the theme "Appropriate Technologies for Development of Meghalaya" was organised at All Saint Cathedral Hall, Lower Lachumiere, Shillong by the State Council of Science, Technology & Environment (SCSTE), Meghalaya. CFRI participated in this three-day programme from 9 to 11 March 2005. Nine organizations/institutions including CFRI participated from different parts of the country to apprise the technologies developed by them.



A view of CFRI Stall in the exhibition at Shillong

### TSUNAMI CONCERN

Tsunami hit the coastal areas of Tamilnadu, Andaman & Nicobar Island and other coastal parts of the country on 26 December 2004. It caused heavy devastation of lives and irreparable loss of the property. Thousands of lives were taken away and many lost their livelihood. CFRI staff members arranged a rally and donated their one-day salary from the month of January 2005 to the affected people through the Prime Minister's Relief Fund.

### PATENT INFORMATION: COAL AND ITS UTILIZATION

1. USP Appl. No. 20050056548 dated. March 17, 2005

*Title* – Method for recovering trace elements from coal

*Author* – Minter, Bruce E. et al.

*Abstract* – The present invention is directed to a method for the recovery of one or more trace elements including gold and one or more platinum group elements from coal. More particularly, the present invention may specify parameters for the selection of coal for combustion, the parameters for combustion of the pre-selected coal, the parameters for the preparation of mixing of a charge for a furnace including ash from the combustion of the coal with an inquant and a fluxing agent, the parameters for the heating of the charge and casting of a dore bar and the parameters for the production of an anode slime from the dore bar. The method of the present invention may also specify parameters for the recovery of silver, gold and one or more trace platinum group elements from the anode slimes.

1. USP Appl. No. 20050061261 dated March 24, 2005

*Title* – Coal Fired Power Station

*Inventor* – Grommes, Klaus, et al.

*Abstract* – The invention relates to a coal-fired power station which is heated by dry firing and which comprises a boiler which is connected to a denitrification catalyst by means of a smoke-gas channel. A coarse ash separator is arranged on the transition point between an ash funnel of the boiler and a horizontal section of the smoke-gas channel, said coarse ash separator comprising an oscillatingly suspended sieve and a stop defining the neutral position of the sieve. The smoke-gas channel sets of the sieve in a pendular motion, whereby coarse ash particles are separated from the sieve and pass into the ash funnel. Said effect is improved by causing the sieve to strike against the stop during the pendular movement thereof. The sieve also forms folds for enlarging the sieve surface and for increasing automatic cleaning effects. Said folds are directed counter to the direction of flow.

### WORLD AROUND

#### URBAN WASTES TO YIELD POWER

The waste from over 90 municipal corporations in the country, which has been contaminating water and air in urban areas, is

now going to generate power in urban areas. After initial teething troubles where two different technologies of generating power from municipal waste failed, the ministry of non-renewable energy resources finally zeroed in on plasma technologies and decided to start a 45 megawatt pilot project in Nagpur to generate power from municipal wastes.

The best part of the project is that neither the municipal corporation of Nagpur nor the Central government will have to spend a penny for it. The entire project will be on BOT (build operate and transfer) basis. The entire money will be invested by an Egyptian company, which would transfer the powerhouse to the municipal corporation after a stipulated period, said the minister of state for MNES, Mr. Vilas Muttewar. After the successful commissioning of the project similar power plants would be installed in other municipal corporations, particularly in metropolitan cities to get rid of municipal waste menace.

Earlier two projects in UP and Andhra Pradesh could not produce desirable results, because the waste was needed to be segregated before being used in the power plant. However, the latest plasma technology does not face any such problem, said a senior officer of the MNES. According to some estimate, Nagpur Municipal Corporation dumps about 800 metric tones waste a day, which would now act as a fuel for the pilot power plant. Initiatives would be taken to implement similar projects in 90 other corporations, mainly in Delhi, Mumbai and Kolkata, which receive over 10,000 metric tons of waste every day. This can generate additional 250 to 500 megawatts electricity, Mr. Muttewar said. And if the entire municipal wastes of 93 municipal corporations are taken into consideration, they can generate as much as 10,000 megawatts power. Though this technology at present is quite expensive compared to conventional power plants, its environmental aspect makes it worthwhile, the minister said. "But we do not need to consider the monetary aspect, because the company is not taking anything from the government except tax exemptions."

Power would be a by-product in this technology. The main purpose will be to avoid water and air contamination pollution, which could spread epidemics in urban areas.

*(Source – The Statesmen, 31.01.05)*

### IMPROVING WARNING SYSTEMS

Post-tsunami, Germany has offered to play a leading role in improving international early warning systems that would help in saving many lives. The USA is also studying appropriate warning systems for Asia. An institute in Potsdam which specialises in earth-quake and tsunami research could undertake the work, the German government said over the weekend.

With our concept we will be able to build an efficient early warning system within one to three years, research minister Mr. Edelgard Bulmahn told German daily Sddeutsche Zeitung. The system would focus on the Indian ocean. It could later be

widened to cover the Mediterranean and the Atlantic ocean. It would cost some 40 million Euro and would warn data centres immediately via Internet, e-mail and sms, the minister added.

The US State Department's Global Disaster Information Network is set to present a design for future protection of coastal areas at the United Nations Sponsored World Conference on Disaster Reduction this month in Kobe, Japan.

*(Source: The Statesman 12.01.05)*

### CFRI IN MEDIA

1. Scientists protest Centre's CMRI-CFRI merger plan (*Hindustan Times 11. 01. 05*).
2. Committee arrived for CFRI-CMRI merger (*Hindustan 12. 01. 05*).
2. High Power Committee gathered information on merger issue (*Hindustan 13. 01. 05*).
3. Need to create interest in science among children since beginning (*Hindustan 13. 01. 05, Prabhat Khabar 17. 01. 05 and 20. 01. 05*).
4. Need of specialisation in country for basic and fundamental research (*Hindustan 14. 01. 05*).
5. Hindi workshop in CFRI (*Hindustan 20. 01. 05*).
6. Training on manufacturing of coke from heat recovery (*Hindustan 22. 01. 05*).
8. Republic Day celebrated at CFRI (*Hindustan 28. 1. 05*).
9. National Science Day celebrated at CFRI (*Hindustan 01. 02. 05*).
10. Workshop on HR Coke Oven concluded (*Hindustan 01. 2. 05*).
11. Committee meet on CMRI-CFRI merger concludes (*Hindustan Times 11. 02. 05*).
12. CMRI-CFRI merger to boost Coal Sector: Dr. Sen (*Hindustan Times 20. 2. 05*).
13. Spring Festival kicks off at CFRI (*Hindustan 30. 3. 05*).

### EVENTS AHEAD

1. CFRI Foundation Day on 22 April 2005
2. National Technology Day on 11 May 2005

### CONTACT ADDRESS

Director, Central Fuel Research Institute  
P.O.-FRI, Dhanbad -828108, Jharkhand, India.  
Telephone – EPABX: (0326) - 2381001 to 2381010, 2381152, 2381173, 2381195, 2381200  
FAX: (0326)-2381113, 2381385, 2460395  
Email: [dnb\\_dcfri@sancharnet.in](mailto:dnb_dcfri@sancharnet.in)  
Website: <http://www.cfriindia.com> , <http://www.cfriindia.nic.in>

Compiled and Edited by Dr S. K. Srivastava, Dr L. C. Ram and Dr Rajesh Kumar; Secretarial Assistance by Shri R. N. Sharma and Shri Samir Acharjee; Published by Director, CFRI, Dhanbad.