



# CPPRI

CENTRAL PULP AND PAPER RESEARCH INSTITUTE, SAHARANPUR (U.P.)

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## MANAGEMENT NEWS

### CESS Committee Meeting

A meeting of the CESS Committee under Development Council for Pulp, Paper & Allied Industries (DCPPAI) was held on November 4, 2011 at Udyog Bhawan, New Delhi. The meeting was chaired by Ms. Shubhra Singh, IAS, Joint Secretary (IPP), Ministry of Commerce and Industry, Government of India.



*Ms. Shubhra Singh, IAS, Joint Secretary (IPP), Shri Rajat Kumar, IAS, Director (IPP) and Dr. R. M. Mathur, Director CPPRI during the Cess Committee Meeting*

The meeting was attended by Shri Rajat Kumar, IAS, Director (IPP), Dr. R. M. Mathur, Member Secretary & Director CPPRI and other members of Cess committee as well as special invites from mill Associations, Ministry of Commerce and Industry, CPPRI etc. Various issues like action taken on the decisions of last CESS committee meeting, review of the on-going projects and consideration of new proposals for approval were taken up as agenda for discussion.

### Meeting of the Development Council for Pulp and Paper and Allied Industries (DCPPAI)

A meeting of DCPPAI was held under the Chairmanship of Shri Harsh Pati Singhania, M. D., J. K. Papers Ltd. on December 28, 2011 at Udyog Bhawan, New Delhi. The meeting was co-chaired by

Shri Talleen Kumar, IAS, Joint Secretary, IPP. While welcoming the dignitaries from Development Council as well as special invitees from Mill Associations, All India Federation of Master Printers (AIFMP), DIPP and scientists from CPPRI, Dr. R. M. Mathur, Director, CPPRI briefly presented the achievement and outcomes of the DCPPAI and CESS funded projects. Various issues related to Indian Pulp & Paper Industry, recommendations of various sub-committees on Raw Materials, Waste Paper, Energy, Environment & Technology, Human Resource Development, Technology Upgradation Fund Scheme (TUFS), now renamed Technology Modernisation Assistance Programme (TMAP), were taken up as agenda for discussion.

## RESEARCH AND DEVELOPMENT ACTIVITIES

### Plan Projects

#### Raw Material and Product Development

##### Optimization of Wet end Operation of Paper Making to Improve the Quality of Paper

A study was conducted using Dynamic Filtration System (DFS) and Particle Charge Detector (PCD) to

	Charge on AKD (mV)	AKD dose (%)	Zeta potential (mV)	Cationic demand ( $\mu\text{eq/g}$ )	Drainage time (sec)	First Pass Retention (%)		
						Total	Filler	Fines
AKD 1	+470	2	-35	8	40	82	45	61
AKD 2	+175	2	-24	20	44	73	31	28

*Effect of Cationicity of AKD emulsion on First Pass Retention & Drainability.*

assess the effect of cationicity of AKD emulsion on First Pass Retention (FPR) and drainability. Two AKD emulsions having different charge + 470 mV and + 175 mV were used with soapstone. The study revealed that the charge on AKD emulsion has a profound influence on wet end performance of

hardwood furnish. On comparison it was found that cationic demand of the furnish was much less and total first pass retention (TFPR) and drainage improved by 12% & 9% respectively when the cationicity of the AKD emulsion was more.

### Printing Quality Evaluation - Assessment and Improvement Possibilities for Indigenous Coated Paper and Paperboard

Laboratory trials were carried out with bar coater on different coating formulations using acrylic as binder. The major pigments used were china clay, ground calcium carbonate and precipitated calcium carbonate in different proportions. The coated sheets were calendered using soft nip mode and were tested for different properties. The results obtained were compared with similar coating formulation containing SB latex as binder. Results showed that a better gloss and smoothness were observed with acrylic binder when china clay is used in coating formulation. Print gloss also behaved in same manner. Further investigations are in progress.

### An Integrated Approach on Application of Biotechnology in Pulp & Paper Industry

Following activities were carried out under the project:

- ♦ **Enzymatic Prebleaching of Pulps:** Mill scale trial of enzymatic prebleaching was conducted on oxygen delignified hardwood pulp (ODL kappa number, 9-10) with commercial xylanase enzyme at Andhra Pradesh Paper Mills Ltd, Rajahmundry. Enzyme showed some good response in terms of brightness improvement in 24 hours however the enzyme trial could not be continued further due to technical problems in the mill.

Evaluation studies of xylanase pH & temperature profile and enzyme prebleaching of pulp on laboratory scale were conducted with commercial xylanase enzyme to be used for mill trials at Delta Paper Mill, Andhra Pradesh. Results

of the lab studies were encouraging i.e. 2.0 unit gain in final brightness of the pulp. Mill trial of enzymatic bleaching was initiated at Delta Paper Mill, Andhra Pradesh with commercial xylanase enzyme.

- ♦ **Enzymatic Refining of Pulps:** Commercial refining enzymes were evaluated for temperature and pH profile of cellulose enzyme to further optimize the process conditions for enzymatic refining of pulps. Studies on enzymatic refining of recycled pulp is in progress.
- ♦ **Bioremediation of Paper Mill Effluent:** Thirty six numbers of new microbial strains were isolated from effluent and sludge samples received from Star Paper Mill out of which 15 no. of bacterial strains were selected after primary screening by activity zone method for further bioremediation studies. Acclimatization studies were conducted with 15 selected bacterial strains. Bioremediation experiments for effective removal of colour and lignin from paper mill effluent using new 15 isolated microbial strains are in progress.

### Energy Conservation and Environmental Management

#### Integrated Approach for Improving Environmental Status of Pulp & Paper Industry

Under the project, studies were carried out in following areas:

- ♦ Adequacy Assessment of existing effluent treatment plant at a RCF based kraft paper mill in meeting the discharge norms. With the implementation of the recommendations made by CPPRI, the mill has been able to reduce water consumption from 30 m<sup>3</sup> / t paper to 18 m<sup>3</sup> / t paper.
- ♦ Assessment of modifications required in existing ETP to treat the effluent to stipulated discharge norms in context of proposed capacity expansion

of a RCF based duplex board mill & RCF based kraft paper mill. Detailed report with suggested modifications have been submitted to the mill.

- ♦ Assessment of modifications required in existing ETP to treat the effluent to stipulated discharge norms in context of switching over of a Agro based writing & printing paper Mill of 25 tpd to RCF based kraft paper mill of 60-65 tpd.

## **Infrastructure and Development Activities**

### **Strengthening of Training & Human Resource Development (HRD) Infrastructure in Pulp, Paper & Allied Industries**

Training was imparted to the following personnel in the area of paper making:

#### **Paper Making**

- ♦ One trainee from Pune University, Pune (Maharashtra) was imparted training in the area of "Pulp & Paper Manufacturing" from September 08 to March 08, 2011.
- ♦ One trainee from Pustak Bhawan, Burhanpur (Madhya Pradesh) was imparted training in the area of "Pulp & Paper Making" from October 31- November 02, 2011.

### **Infrastructure Development for Extension of Library and Documentation Service to the Indian Paper Industry**

#### **Current Awareness Services (CAS) and Selective Dissemination of Information (SDI)**

was provided from the current journals related to Pulp and Paper to 50 member mills of CPPRI as well as to Institute Scientists.

**Published** and circulated CPPRI News Bulletin for the duration of July - September, 2011 to the DIPP, Associations of Pulp and Paper Mills, Allied Industries, R & D Institutions, Member Mills and other Organizations.

**Fifteen Visitors** from different organizations visited the Library and Documentation Centre to fulfil their information need during the period from October-December, 2011.

## **CESS Funded Projects**

### **Studies on Ozone Treatment of Indigenous Raw Material Pulp for Better Bleachability**

Under this project studies on ozone treatment of eucalyptus pulp having kappa no. 17 were continued. Eucalyptus pulp was subjected to various bleaching sequences incorporating ozone viz. OZDEpD, OZEP in addition to ZDEp and ZDEpD sequences. DEpD and ODEpD bleaching of eucalyptus pulp was also carried out to compare the results of ECF bleaching of eucalyptus with and without ozone treatment. Physical strength and optical properties were determined for all sequences.

### **An Integrated Approach for Utilization of Bagasse Pith for Production of Bio-ethanol and Value Added Lignin Products (CPPRI/IIP, Dehradun)**

The project aims the production of bio-ethanol & other value added by products from bagasse pith, a waste biomass from Sugar & Bagasse based paper industry adopting a biorefinery approach. During the period, commercial cellulase and glucosidase enzymes were analysed for their CMCase, FPase,  $\beta$ -glucosidase activities, temperature and pH profile of these enzymes were determined. Bench scale studies on prehydrolysis of bagasse pith followed by enzymatic saccharification of prehydrolysed pith with evaluated commercial enzymes were carried out under optimized conditions to recover maximum amount of fermentable sugars. Proximate analysis of residual biomass of each stage after prehydrolysis and enzymatic saccharification was done for different parameters like lignin, pentosan, holocellulose and ash.

## Sponsored Projects

### **Development of Environmentally Safe Biological Process to Bleach the Bamboo & Wood Pulp using Potential Bacteria (CPPRI/IGIB, New Delhi)**

The aim of the project is to develop the process of biobleaching of bamboo & wood pulp using ligninolytic bacteria for the reduction of chlorinated bleaching chemicals and improvement in pulp quality and its evaluation and validation in an identified paper mill. Studies on Isolation of lignolytic bacteria are initiated by IGIB. Preliminary studies showed that 4-6 unit brightness improvement of final pulp was achieved with the developed bacteria by IGIB.

### **Fibre Modification of Enzymes (CPPRI/ TCIRD/ IPMA)**

The object of the project is development of enzyme refining technology for recycled pulps to improve the pulp quality, drainability and to reduce the refining energy if, any. Studies on enzymatic refining of recycled pulp were conducted with two commercial Cellulase enzymes. Results were encouraging in respect of better strength properties like 5% tensile index and 2% Burst index etc.

### **Technological Improvement of a Process of Biological Reduction of AOX, Colour, COD and BOD of Waste Water Emanated from Large Pulp & Paper Industries (CPPRI/IGIB, Star Paper Mills Ltd., Department of Biotechnology, New Delhi)**

The project aims to develop an effective microbial (bacterial consortium) technology for the reduction of AOX, Colour, COD and BOD of waste water from large Pulp & Paper Industries at Pilot scale. After the successful completion of the phase -1 activity (pilot trial at M/s Star Paper Mill), the report has been submitted to DBT.

### **Improved Energy Efficiency through Utilization of Lignin based Biomass from Agro Based Paper Mills- Sponsored by PCRA, New Delhi**

After successful completion of the first phase of the project sponsored to CPPRI, PCRA has sponsored a project to commercialize the technology developed and first phase for production of lignosulphonate from waste lignin generated in small agro based paper mill. Mill has been identified and expression of Interest has been called to select a suitable technology promoter. Laboratory studies are continued.

### **Technical assistance to Star Paper Mills Limited in the area of Chemical Recovery sponsored by M/s Star Paper Mills Limited**

An integrated large paper mill has undergone an annual contract with CPPRI for monitoring and troubleshooting in the area of chemical recovery. Scientists of the institute's are visiting the mill on regular intervals and are helping the mill in running the chemical recovery units in a smooth way.

## Overseas Projects

### **A Comparative Pulping & Bleaching Studies on Indian & Australian Bagasse**

An international project entitled "A Comparative Pulping & Bleaching Studies on Indian & Australian Bagasse" has been entrusted to the Institute by Queensland University of Technology, Australia.

The objective of the project is to compare the strength & optical properties of Indian and Australian bagasse pulp produced by Soda AQ pulping process and bleached by DEpD sequence to achieve 85% ISO brightness.

Bagasse from Australia has been received & also collected from an Indian Paper Mill. Proximate Chemical Analysis of the two bagasse samples is in progress.



## TECHNICAL/CONSULTANCY SERVICES

Technical Assistance/Consulting services were rendered to following Pulp and Paper Mills:

- Technical services were rendered to the following mills and organizations by analyzing their effluents / solid waste samples or carrying out air monitoring studies for various pollution parameters:

1. JK Paper Ltd., Rayagada, Orissa
2. HPC - Nagaon Paper Mills Ltd., Kagaznagar, Assam
3. JK Paper Ltd., ( Unit : Central Pulp Mills), Fort Songadh, Gujarat
4. Bilt (Unit Shree Gopal), Yamunanagar, Haryana
5. Sainsons Paper Industries Ltd., Pehowa, Haryana
6. The West Coast Paper Mills Ltd., Dandeli, Karnataka
7. Arihant Pulp & Papers Pvt. Ltd., Muzaffarnagar (U.P.)
8. Banwari Paper Mills Ltd., Kashipur, Uttrakhand
9. Silverton Papers Ltd., Muzaffarnagar (U.P.)
10. Bindlas Duplux Ltd., (Unit II), Muzaffarnagar (U.P.)
11. Vishvakarma Paper and Board Ltd., Kashipur, Uttrakhand
12. Rayana Paper Industries Ltd., (Unit I & II), Khalilabad, (U.P.)
13. Naini Group of Industries Ltd., Kashipur, Uttrakhand
14. Century Pulp & Paper Ltd., Lalkuan, Uttrakhand
15. Ambala College of Engineering & Applied

Research, Ambala, Haryana

16. Satia Paper Mills Ltd., Muktsar, Punjab
17. Kumaon Garhwal Chamber of Commerce & Industry (Paper Unit Chapter) Kashipur, Uttrakhand
18. Shreyans Industries Ltd., Ahmedgarh, Punjab
19. Seshasayee Paper & Boards Ltd., Erode, Tamilnadu

- Technical Assistance/Consultancy were provided in areas of ETP Adequacy Assessment/Trouble shooting/ETP upgradation, Hazardous Waste Audit to following mills & organisations:

1. Arihant Pulp & Papers Pvt. Ltd., Muzaffarnagar (U.P.)
2. Banwari Paper Mills Ltd., Kashipur, Uttrakhand
3. Silverton Papers Ltd., Muzaffarnagar (U.P.)
4. Bindlas Duplux Ltd., (Unit II), Muzaffarnagar (U.P.)

- 448 Nos. of Paper & Paper Board samples received from various organizations/ mills were tested for GSM, Thickness, Tensile, Tear, Burst, Opacity, Gloss, (I, a, b values), Whiteness, Double fold, RCT, Smoothness, Porosity, Formation, Bending Stiffness, Printing properties analysis.
- 03 Nos. samples of tile received for calibration were also tested during this period.
- 39 Nos. of samples of Black Liquor, Soil, Dust, and Secondary Sludge & Coal were evaluated for various parameters viz. Fe, Ca, and C, H, N, S received from different mills.
- 1 Nos. enzyme sample received from Value Addition, New Delhi was evaluated for Xylanase activity, temperature & pH profile of xylanase activity.
- 2 Nos. Sewage water samples were evaluated for Total Coliform and Faecal Coliform received from different Paper mills.

- ♦ Laboratory studies on Effect of cooking aid on black liquor properties were carried for a supplier of cooking aid.
- ♦ Data bank on chemical recovery operational parameter and product was done for a large integrated paper mill.
- ♦ Technical services were rendered to nine mills in the area of chemical recovery.
- ♦ Evaluation of bleached pulp for M/s Seshasayee Paper & Boards Ltd, Erode, Tamilnadu.
- ♦ Testing for composition of waste paper (printed bleached board cutting) for Custom Department, Ludhiyana.
- ♦ Calibration of PFI Mill (PTI make) for M/s Frank PTI, Saharanpur.
- ♦ Testing of brown grade waste paper sample for M/s VLS Fibre, Chennai
- ♦ Feasibility Study for Production of Specialty Grade Pulp from Bamboo carried out for Thea-Text-Healthcare Mumbai, India.
- ♦ Laboratory Pulping & Bleaching Trial of Canadian Wheat Straw (International) carried out for Prairie Pulp & Paper Inc., Canada.
- ♦ Production of Filler Pulp from Indian Hardwood and Bamboo carried out for D-InkKing Technology, Shivakashi, Tamilnadu.
- ♦ Optimization of Pulping & Bleaching Chemical with respect to Industry Norms and Best Practice (Nagaon & Cachar Paper Mill) carried out for Hindustan Paper Corporation Limited (HPC), Kolkata.
- ♦ Fibre Furnish Analysis was carried out in 11 Nos. of Pulp, Paper & Board Samples.
- ♦ 42 Nos. of different sample of raw materials were analyzed for Moisture Content, Proximate Chemical Analysis
- ♦ 2 Nos. sample of white Liquor were analyzed for sulfidity and active alkali.

## WORKSHOP/SEMINAR/MEETINGS

### Workshop/Conference

- ♦ Dr. R. M. Mathur, Director, Dr. Vimlesh Bist, Sc. 'F', Dr. R. K. Jain, Sc. 'F', Mrs. Rita Tandon, Sc. 'F', Dr. Suresh Panwar, Sc. 'F', Dr. B. P. Thapliyal, Sc. 'E-II', Dr. M. K. Gupta, Sc. 'E-II', Sh. P. C. Pandey, Sc. 'E-II', Dr. Rajnish Tandon, 'E-I', Dr. A. K. Dixit, Sc. 'E-I', Dr. Shivakar Mishra, Sc. 'E-I', Dr. Priti Shivhare, Sc. 'E-I', Dr. Nitin Endley, Sc 'E-I', Dr. Sanjay Tyagi, Sc. 'C', Sh. Alok Goel, Sc. 'C', Dr. Vasanta Thakur, Sc. 'B', Sh. Satya Negi, Sc. 'B' attended the International Conference on Pulp, Paper & Allied Industry (Paperex 2011) held at New Delhi from December, 10-12, 2011.
- ♦ Dr. M. K. Gupta, Sc. 'E-II' attended IPPTA Workshop on Closing of Water Loop - Treatment & Conservation held at Tamilnadu Newsprint & Papers Ltd., Kagithapuram, District Karur, and Tamilnadu on November 10-11, 2011.

### Meetings

- ♦ Dr. R. M. Mathur, Director CPPRI, & Dr. R. K. Jain, Sc. 'F' convened meeting for preparation of the Business Model of CPPRI with members of the sub-committee chaired by Dr. Vimal Kumar, Advisor, Department of Science & Technology, Govt. of India.
- ♦ Dr. R. M. Mathur, Director CPPRI, Dr. S. Panwar, Sc. 'F' & Dr. Nitin Endlay, Sc. 'E - I' attended a meeting of Peer & Core Committee at CPCB Delhi on November 14, 2011 and made a presentation on the revised environmental standards proposed by Central Pulp & Paper Research Institute (CPPRI), Saharanpur for Pulp & Paper Mills. The proposed norms have been unanimously accepted by CPCB Peer & Core Committee and are likely to be notified soon.
- ♦ Dr. R. M. Mathur, Director CPPRI, Dr. S. Panwar, Sc. 'F' & Dr. Nitin Endlay, Sc. 'E - I' attended a meeting at CPCB Delhi on November 22, 2011 to

make a presentation and discuss the Action Plan prepared for implementation of recommendations related to water recycling and pollution prevention for pulp & paper mills in river Ganga Basin based on recommendation of CPCB sponsored project study on "Techno-economic Feasibility for Setting up of Common Chemical Recovery Plant (CCRP) & Common Effluent Treatment Plant (CETP) for Pulp & Paper Industries Operating in identified Cluster of Uttar Pradesh & Uttarakhand" jointly carried out by CPPRI, IIT Delhi, IIT Kanpur, IIT Roorkee.

- ♦ Dr. R. K. Jain, Sc. 'F' visited Department of Biotechnology to review the progress of the on going project sponsored by Department of Science & Technology with Institute for Genomics & intergrative Biology, CSIR, Delhi.
- ♦ Dr. R. K. Jain, Sc. 'F' visited ICFRE in connection with the signing of MoU to be entred between CPPRI & ICFRE for M.Sc. & Ph. D programme.
- ♦ Dr. R. K. Jain, Sc. 'F' & Dr. A. K. Dixit, Sc. 'E - I' visited centre for Fly Ash Research & Management, New Delhi for preparation of the joint project proposal on Utilization of Lime Sludge Waste in soil amendment & brick madking.
- ♦ Dr. R. K. Jain, Sc. 'F' & Dr. A. K. Dixit, Sc. 'E - I', visited Petroleum Conservation & Research Association, New Delhi for attending the meeting on PCRA sponsored project on "Improved Energy Efficiency through Utilization of Lignin based Biomass from Agro Based Paper Mills".
- ♦ Dr. R. K. Jain, Sc. 'F', Dr. A. K. Dixit, Sc. 'E - I', Dr. Vasanta V Thakur, Sc. 'B' & Shri Diwakar Pandey visited Indian Institute of Petroleum, Dehradun to participate in the meeting on cess funded project "Production of Bioethanol from Bagasse pith".
- ♦ Mrs. Rita Tandon, Sc-'F' attended meeting on CPGRAMS and Public Grievance at DIPP, New Delhi on October 20, 2011.
- ♦ Mrs. Rita Tandon, Sc-'F' attended RAC meeting at Yamunanagar campus, TCIRD on November 04, 2011.
- ♦ Dr. S. Panwar, Sc. 'F' attended a Meeting of the Project Review Committee (PRC) at Aligarh Muslim University (AMU), Aligarh on December 15, 2011 to review the progress of the Ministry of Environment & Forests (MoEF) sponsored project- "Performance Evaluation of Pilot Plant based on Sequencing Batch Reactor for the Biodegradation of Adsorbable Organic Halides (AOX) from Pulp and Paper Mill Waste Water". The project is being executed by Department of Civil Engineering AMU.
- ♦ Dr. S. Panwar, Sc. 'F', Dr. Nitin Endlay, Sc. 'E-I' & Mohd Farid R. A. attended a meeting with officials of Pulp & Paper Mills in Kashipur Cluster on October 7, 2011, to discuss the implementation of recommendations and the Action Plan proposed under the CPCB Sponsored study on "Techno-economic Feasibility for Setting up of Common Chemical Recovery Plant (CCRP) & Common Effluent Treatment Plant (CETP) for Pulp & Paper Industries Operating in Identified Cluster of Uttar Pradesh & Uttarakhand".
- ♦ Dr. S. Panwar, Sc. 'F' and Dr. Shivaker Mishra, Sc. 'E-I' attended a meeting with officials of Pulp & Paper Mills in Meerut Cluster on October 13, 2011, to discuss the implementation of recommendations and the Action Plan proposed under the CPCB Sponsored study on "Techno-economic Feasibility for Setting up of Common Chemical Recovery Plant (CCRP) & Common Effluent Treatment Plant (CETP) for Pulp & Paper Industries Operating in Identified Cluster of Uttar Pradesh & Uttarakhand".
- ♦ Dr. B. P. Thapliyal, Sc. 'E-II', visited the following organization during the quarter.
  1. Meeting at DIPP, Ministry of Commerce and Industry, New Delhi for submission of working group report in October 2011.



2. Meeting with GIZ, New Delhi for Solar Interventions in October 2011.
3. Meeting with Feedback Infra Limited at New Delhi in November 2011 & October 2011 regarding Solar Interventions in Pulp & Paper Mills.
4. Cess Meeting in November 2011 at Udyog Bhawan, New Delhi.

## LECTURES & PRESENTATIONS

### Presentations

- ♦ Dr. M. K. Gupta made a presentation on "Sharing Experience in reducing the Water Footprint in Pulp & Paper Sector" at WWF - FICCI workshop Meerut on December 22, 2011.

### Internal Lectures

- ♦ Shri Tarun Sharma, JRF Delivered a lecture on "Physico-Chemical Properties of Black Liquor" as on November 8, 2011.
- ♦ Dr. J. Fellegi, Consultant, Paper Chemistry & Technology, Fellegi Techno Eco Consulting Slovak Republic delivered a lecture on "Converting an alkaline pulp mill into an integrated forest products biorefinery" as on December 6, 2011.
- ♦ Ms. Nidhi Sharma, JRF delivered a lecture on "Composition of Fibrous Raw materials used in Indian Paper Industry" as on December 20, 2011.

## REPORTS AND PUBLICATIONS

### Reports

- ♦ Report on Adequacy Assessment of Existing Effluent Treatment Plant at Arihant Pulp & Papers Pvt. Ltd., Muzaffarnagar (U. P.).
- ♦ Report on Modification of Existing Effluent Treatment Plant for Treatment of Waste Water Generated from Waste Paper at Banwari Paper Mills Ltd., Kashipur, Uttarakhand.

- ♦ Report on Treatment Measures for Waste Water, Air Pollution And Solid Waste After Proposed Capacity Expansion to 200 tpd Kraft Paper at Sainsons Paper Industries Ltd., Pehowa, District Kurukshetra , Haryana.
- ♦ Report on Modification of Existing Effluent Treatment Plant for Treatment of Mill Effluent to be generated from 90 tpd Kraft Paper Using Waste Paper at Silverton Papers Ltd., Muzaffarnagar (U. P.).
- ♦ Report on Modification of Existing Effluent Treatment Plant for Treatment of Effluent to be Generated from 100 tpd Duplex Board using waste paper Bindlas Duplux Limited (Unit II), Muzaffarnagar (U. P.).
- ♦ Report on Audit Assessment of Hazardous Waste at Century Pulp & Paper Ltd., Lalkuan, Uttarakhand.

### Publications

- ♦ Dr. Vimlesh Bist, Dr. Priti S. Lal, Shri Arvind Sharma & Dr. R. M. Mathur "Studies on Chemical Pretreatment Options Followed by ECF and TCF Bleaching of Indigenous Raw Material's Pulp" - Inpaper India, 14(5):4-12 (2011).
- ♦ Dr. R. K. Jain "A Novel Approach to achieve Zero Black Liquor discharge to mitigate pollution problem in small agro based paper mills" Proceedings of 10<sup>th</sup> International Conference on Pulp, Paper & Allied Industry (Paperex) at New Delhi from December 10-12, 2011.
- ♦ Dr. S. Panwar, Dr. Shivaker Mishra, Dr. Nitin Endlay, Mohd. Farid, Dr. M. K. Gupta, Dr. R. M. Mathur, Toxicity Potential in AOX Bearing ETP sludge - A Reality Check. Proceedings of 10<sup>th</sup> International Conference on Pulp, Paper & Allied Industry (Paperex) at New Delhi from December 10-12, 2011, Pg. 238-242.
- ♦ Dr. Nitin Endlay, Dr. Shivaker Mishra, Dr. M. K. Gupta, Mohd. Farid, Kaushambi Jain, Dr. S.

Panwar & Dr. R. M. Mathur "Reduction of Water Footprint in Agro & RCF based Pulp & Paper Mills - Scope, Possibilities & Available Options" IPPTA Vol. 23 (4):129-133(2011)

- ♦ Paper & entitled "A Novel Approach to achieve Zero Black Liquor discharge to mitigate pollution problem in small agro based paper mills" presented by Dr. R. K. Jain during the Paperex-2012 International Conference held at Pragati Maidan, New Delhi.

## INTERACTION WITH INDUSTRY

- ♦ Interaction with M/s Andhra Pradesh Paper Mill, Rajmundry and M/s Delta Paper mill, Andhra Pradesh for mill scale studies of xylanase bleaching.
- ♦ Interaction with M/s Star Paper Mills Ltd., SRE in connection with the pilot trial on developed biological effluent treatment process under DBT sponsored project.
- ♦ Continuous interaction with reputed enzyme manufacturers and suppliers viz. Value addition, Novozymes, Natuzyme for procurement of enzymes for various enzyme applications in Pulp & Paper making.
- ♦ Technical support for troubleshooting and monitoring of chemical recovery system on annual contract basis to M/s Star Paper Mills, Saharanpur.

## Visits to Mills & Other Organisations

- ♦ Dr. R. K. Jain, Sc. 'F', Dr. Rajnish Tandon, Sc. 'E-I' and Dr. A. K. Dixit, Sc. 'E-I' visited M/s Star Paper Mills Limited for trouble-shooting in the area of Chemical recovery section.
- ♦ Dr. R. K. Jain, Sc. 'F' and Dr. A. K. Dixit, Sc. 'E-I' visited Petroleum Conservation Research Association (PCRA), New Delhi for discussions on PCRA sponsored project.
- ♦ Dr. R. K. Jain, Sc. 'F', Dr. A. K. Dixit, Sc. 'E-I' and

Shri Aash Muni Singh, Sc. 'B' visited M/s Madhya Bharat Paper Mills Limited, Champa for pilot plant trials on Color removal from effluent using fly ash.

- ♦ Dr. R. K. Jain, Sc. 'F', Dr. A. K. Dixit, Sc. 'E-I' and Shri Diwakar Pandey, JRF visited Indian Institute of Petroleum, Dehradun, to attend the review meeting of Bioethanol and other value added products through enzymatic hydrolysis of bagasse pith under CESS project.
- ♦ Dr. R. K. Jain, Sc. 'F' and Dr. A. K. Dixit, Sc. 'E-I' visited M/s Delta Paper Mills Limited for conducting the chemical recovery audit.
- ♦ Dr. R. K. Jain, Sc. 'F', Dr. Vasanta V. Thakur, Sc. 'B', Shri B. Pandey, TO 'A' and Mr. Vipin Gupta, JRF visited M/s Andhra Pradesh Paper Mills Ltd., Rajmundry for conducting mill trial of xylanase enzymatic bleaching.
- ♦ Dr. S. Panwar, Sc. 'F', Dr. Nitin Endlay, Sc. 'E-I' and Mohd. Farid R. A. visited Vishvakarma Papers Ltd., Kashipur, Uttrakhand for Environmental monitoring.
- ♦ Dr. S. Panwar, Sc. 'F' and Dr. Nitin Endlay, Sc. 'E-I' visited Magnum Ventures Ltd., Ghaziabad, U. P. for Study of Water Conservation Systems adopted by the mill .
- ♦ Dr. M. K. Gupta, Sc. 'E-II' and Dr. S. Mishra, Sc. 'E-I' visited Deen Bandhu Chottu Ram Thermal Power Plant, Yamuna Nagar, Haryana for Participation in opening of bids for Environmental Monitoring Contract.
- ♦ Dr. S. Mishra, Sc. 'E-I' and Mohd. Farid, R. A. visited Bahl Papers Ltd., Kashipur, Uttrakhand for Technical Services.
- ♦ Dr. S. Mishra Sc. 'E-I' and Mohd. Farid, R. A. visited Bilt (Unit - Shree Gopal), Yamuna Nagar for Envir-onmental Monitoring.
- ♦ Dr. S. Mishra, Sc. 'E-I' Shri R. P. Singh, T. O. 'A', Shri M. S. Pundir, T. O. 'A', Shri M. S. Bhandari, 'TG-VI' and Mohd. Farid, R. A. visited Deen Bandhu

Chottu Ram Thermal Power Plant, Yamuna Nagar, Haryana for Environmental Monitoring on weekly basis.

- ♦ Shri Satya Dev Negi, Sc. 'B' visited Mohit Paper Mill, Bijnor to collect paper and back water samples on November 29, 2011 & December 01, 2011.
- ♦ Shri Diwakar Pandey, JRF, Ms. Chetna Gupta, JRF, Shri Dhermander Kumar, JRF and Mr. Vipin Gupta, JRF visited Paperex Exhibition, 2011 at Pragati Maidan, New Delhi.
- ♦ Mr. Vipin Gupta, JRF and Shri Dhermander Kumar, JRF visited M/s Delta Paper Mill, Andhra Pradesh for conducting mill trial of xylanase enzymatic bleaching.

## STAFF NEWS

**Dr. T. K. Roy**, Sc. 'F' superannuated from the institute's services w.e.f November 30, 2011(A/N)

## ABSTRACTS

Wang, Yang and Liu, Shijie. **Pretreatment Technologies for Biological and Chemical Conversion of Woody Biomass.** *Tappi journal*, 11(1): 9-16 (2012).

**Abstract:** Woody biomass is an important alternative source for chemicals, materials, and energy. Although different routes of woody biomass conversion have been proposed in various studies, typical biochemical production processes using woody biomass feedstocks consist of four major steps: pretreatment, hydrolysis, fermentation, and separation. Pretreatment remains the most important step in biomass conversion. This paper is a review of available pretreatment technologies for woody biomass bioconversion.

**Keywords:** Pretreatment technologies, Biological conversion, Chemical conversion, Wood biomass conversion.

Almeidn, Gustavo Matheus De; Cardos, Marcelo and

Park, Song Won. **Detecting an Abnormality in a Recovery Boiler Using Dynamic Multivariate Data Analysis with Parallel Coordinate Plots.** *Appita journal*, 65 (1): 78-86 (2012).

**Abstract:** Data visualization techniques are powerful in the handling and analysis of multivariate systems. One such technique known as parallel coordinates was used to support the diagnosis of an event, detected by a neural network-based monitoring system, in a boiler at a Brazilian Kraft pulp mill. Its attractiveness is the possibility of the visualization of several variables simultaneously. The diagnostic procedure was carried out step-by-step going through exploratory, explanatory, confirmatory, and communicative goals. This tool allowed the visualization of the boiler dynamics in an easier way, compared to commonly used univariate trend plots. In addition it facilitated analysis of other aspects, namely relationships among process variables, distinct modes of operation and discrepant data. The whole analysis revealed firstly that the period involving the detected event was associated with a transition between two distinct normal modes of operation, and secondly the presence of unusual changes in process variables at this time.

**Keywords:** Diagnosis task, Process historical data, Multidimensional visualization, Parallel coordinates, Industrial data analysis.



## VIGILANCE AWARENESS WEEK

Central Pulp and Paper Research Institute (CPPRI) observed 'Vigilance Awareness Week-2011' from October 31st to November 5th, 2011. This year the theme of Vigilance Awareness Week was "Participative vigilance". Dr. R. M. Mathur, Director and Dr. R. K. Jain, Sc 'F' & CVO conveyed their message on the occasion. To generate awareness, Posters and banners were displayed at various places of the institute in order to promote transparency & integrity among the staff members to combat the menace of corruption tooth and nail.



Officials of CPPRI taking oath on 31st October, 2011

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**We welcome suggestions & comments for further improvement of this New Bulletin.**