



# NCB NEWS

JUNE 2019

## From the desk of Director General

It gives me immense pleasure in presenting NCB e-News to the Cement, Concrete, Construction, building materials & allied sectors. This is a perfect way of communicating latest developments and contributions of NCB to the industry.

After assuming charge at the helm of this great institute, I carried out discussions with heads of various cement companies, government institutions and academia in various parts of the country. Apart from discussions on policy related matters pertaining to cement sector, these meetings also focused on understanding the present needs of the Indian cement industry and Key Result Areas expected from NCB. Having carried out more than 5000 sponsored projects successfully and greater than 100 patents, NCB is recognized as a pivotal institution and knowledge bank for the cement industry.

I along with my multidisciplinary team of highly qualified and vastly experienced scientists and engineers have chalked out an ambitious plan to conduct frontline research activities till 2021 and beyond in areas such as: enhancing mine life, low carbon and multi-component blended cements, alternative binders and cementitious materials, renewable energy, alternate fuels and raw materials, productivity & environment improvement, stable & durable construction systems, high performance concrete systems and Carbon Capture & Utilization to meet the target of emitting 0.350 t of CO<sub>2</sub>/t of cement well before 2050.

This version of NCB e-news covers the release of Bharatiya Nirdeshak Dravya (BND) vials as well as Compendium on "The Cement Industry – India 2018". NCB is providing TPQA services for projects of national importance in Delhi like India International Convention and Expo Centre at Dwarka as well as International Exhibition & Convention Centre at ITPO. MoU with Oman Cement Company is a testament to NCB's growing presence outside India as well. NCB regularly assesses the knowledge gap of industry professionals vis-à-vis the present global benchmark and takes a leading role to fill the gap by disseminating information to cement industry professionals by way of technical trainings and Forum for Science & Technology specifically aimed to provide advanced know-how relating to areas such as cement quality, cement products, process technology and optimization, alternative fuels, energy management and environmental issues. NCB also collaborates with various government institutes as well as private groups to share intellect on management of air pollution, treatment and utilization of industrial and mining wastes for sustainable environment and possibilities for improving life of railway sleepers.

I'm very excited to inform you that the 16<sup>th</sup> NCB International Seminar on Cement, Concrete & Building Materials is scheduled to be held from 3<sup>rd</sup> to 6<sup>th</sup> December 2019 at Manekshaw Centre, Delhi where the captains of cement and concrete sector, policy makers, academicians, professionals, engineers and scientists are expected to come under one roof and discuss future action plans aimed towards clean and green production and responsible consumption of the resources utilized in cement sector to ensure long term sustainability.

I look forward to your presence in our seminar and wish you all the success

**Dr. B N MOHAPATRA**  
**DIRECTOR GENERAL**



National Council for Cement and Building Materials

*announces*

**16<sup>th</sup> NCB INTERNATIONAL SEMINAR ON  
CEMENT, CONCRETE AND BUILDING MATERIALS**

**03-06 DECEMBER 2019**

**MANEKSHAW CENTRE, NEW DELHI, INDIA.**

**We are eagerly awaiting your presence there**

**NATIONAL COUNCIL FOR CEMENT AND BUILDING MATERIALS**

(Under the Administrative Control of Ministry of Commerce & Industry, Govt. of India)

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**NCB family welcomes, Dr. Bibekananda Mohapatra, appointed as Director General of National Council for Cement & Building Materials, a premier research institute of India in Cement and Building Materials** by the approval of the Cabinet Committee under PMO. He brings with him over 32 years of cross-functional experience in areas of Research and Development and has ability to guide the organization towards carrying out research activities aimed for achieving cement sustainability, reduction of CO<sub>2</sub> emissions & low energy cement, are of prime relevance to the industry today. Dr. Mohapatra earned his Ph.D degree in Cement Mineral Chemistry under guidance of Dr. G Goswami, Ex-Principal Scientist of Dalmia Institute of Scientific and Industrial Research. He commenced his career as Lecturer in Chemistry and

then Scientist in Dalmia Institute of Scientific and Industrial Research, Rajgangpur, Odisha. He worked as HOD (*Quality Assurance*) in Orissa Cement Limited for about 10 years and later joined Vikram Cement Works (A Unit of UltraTech Cement Ltd), Khor, Dist. Neemuch (MP) as Assistant Vice President. Dr. Mohapatra worked as Vice President (*New Product Development and Product Quality Management*) in the Corporate Sector of Ambuja Cements Limited, Mumbai prior to joining NCB. He has expertise in characterization of materials covering physical, physio-thermal, thermal (*like DTA/DTG*) and X-ray diffractometry. He has done extensive research works on effect of inherent Fluorine in cement manufacturing process and cement quality. His contribution in use of alternate fuel by utilizing hazardous wastes and all agricultural refuses brought a new dimension to the cement manufacturing of the country. He was also associated with development and commercial production of cement such as Composite Cement, Sulphate Resisting Portland Cement, Oil Well Cement, etc.

His innovations and leadership in implementing many quality programmes resulting in product quality improvement are widely accepted. He has attended many National and International Conferences and published about 68 research papers in reputed journals of both National and International fame. Under his leadership, Vikram Cement Works bagged 13 prestigious awards like (i) Rajiv Gandhi Award for Quality-2010 (*Best of All*) by BIS (ii) Rajiv Gandhi Award for Environment-2011 by MoEF (iii) CII Best Environment Award-2012 (iv) CII Best Energy Award-2012 (v) Indian Manufacturing Excellent Award-2012 (vi) 14<sup>th</sup> National Award for Excellence in Energy Management 2013 by CII (vii) "Best Environmental Excellence in Plant Operation 2012-13" by NCCBM, New Delhi (viii) "IMC Ramakrishna Bajaj National Quality Award" consecutively for three years i.e., 2011, 2012 & 2013 by Indian Merchant Chamber, Mumbai Some awards to his name are (i) Best paper award in 7<sup>th</sup> NCB International Seminar on Cement and Building Materials for the paper "Impact of New Generation on Granulometry of cement ground in VRM" (ii) Best paper award in 13<sup>th</sup> NCB International Seminar on Cement and Building Materials for the paper "Indian Experience of Using AFR in Cement Kiln" and (iii) Best paper award in 15<sup>th</sup> NCB International Seminar on Cement, Concrete and Building Materials for the paper "A study of Mineralogy and Microstructure of Clinker by XRD and Microscopy". He has also been a member of many awards selection committee and is recognized as one of the leading cement scientist of the country. He has also authored a book on "*Application of X-Ray Diffractometry in Cement Quality Control System*" which was released during 14<sup>th</sup> NCB International Seminar held at Delhi in December 2015. This book holds much value to all the Quality Personnel working in cement industries, Research Organization, education institutes i.e. IIT, NIT and various engineering colleges.

He completed the Corporate Management for India for companywide Quality Management Program being selected by Association for Overseas Technical Scholarship (AOTS), Japan. He has been an Auditor for American Petroleum Institute (API Spec Q1), Quality Certification for ISO 9001-2008, EMS 14001 and OHSAS. He is a Certified Examiner for Quality Management for IMC RBNQA Trophy and Member of Quality Management Sectional Committee, MSD 2 nominated by BIS. He is a member in various Committees of Bureau of Indian Standards (BIS), State Pollution Control Board (SPCB), Central Pollution Control Board (CPCB), Ministry of Environment & Forests (MoEF) and Central Ground Water Authority (CGWA), Govt. of India.

He has also retained membership of various committees such as (i) Member of BIS Cement & Concrete Sectional Committee CED 2, Cement Pozzolana and Cement Additives sub-committee CED 2:1 and Concrete Sub-committee CED 2:2 (ii) Member of Research Advisory Committee of National Council for Cement and Building Materials (NCCBM) (iii) Member of technical committee for development of Low Calcined Clay Cement (LC3) of IIT-Mumbai, Delhi & Chennai & TARA (iv) Member of Research Advisory Committee at DISIR (*Dalmia Institute of Scientific and Industrial Research*), Rajgangpur, Odisha (v) Member of Scientific Committee of 15<sup>th</sup> International Congress on Chemistry of Cement (ICCC) out of four Indian Scientist to be held at Prague at 2019 and (vi) Member of Technical Committee for the development of standards for RMC (*Formed by CII*).

During his 32 years long and challenging career, some of the key areas of activities and contribution include (i) Mineral and Material Characterization (ii) Waste Elimination and Utilization (iii) New Product Development (iv) Utilization of Alternate Fuel & Raw Materials (AFRs) for Sustainability (v) Research on Cement Technology (vi) Quality Control & Quality Assurance (vii) Concrete Technology (viii) Project Management (ix) Leadership & Team Management (x) Technology Selection (xi) Raw Material Handling (xii) Environment Management System & Control; (xiii) Client Relationship Management (xiv) Member of professional bodies; and (xv) Professional Training to academia and industries like IITs, engineering institutes, NCCBM, Research Institutes etc. and produced pragmatic solutions to the problems faced by industry. Some of his significant contributions include (i) Successful incineration of cement poppy straw/doda chura in the cement kiln in environment friendly manner (ii) Innovative approach and co-ordination between Pollution Control Board and Industry for successful disposal of hazardous waste Opium Marc stored in Opium Alkaloid plant in cement kiln involving all the Government Authorities (iii) Successful incineration of non-recyclable plastic and Refused Derived Fuel in Cement Kiln in Madhya Pradesh and use of 100% pet coke in Cement Kilns.

During his tenure of service, he has shown exemplary performance in demonstrating his ability to accomplish task with discipline, hard work and innovative skills in executing assignments and projects by coordinating with internal and external stakeholders. His remarkable personality and zeal is a result of assimilation of a stable research background with a flexibility to adopt modern technology with an understanding of issues. We wish that his vision will be instrumental for NCB to rise to new heights and explore new horizons for the good of the industry and society at large.





# 71<sup>st</sup> Research Advisory Committee (RAC)

A high level 71<sup>st</sup> Research Advisory Committee (RAC) meeting under chairmanship of Shri Ashwani Pahuja (*Exec Director- Dalmia Bharat Cement Ltd.*) was organized at NCB-Ballabgarh office. This meeting is held twice in a year. RAC is the highest Research and Innovations body of NCB which paves the way for advanced research in cement & concrete and comprises of eminent and learned technocrats representing Indian cement and concrete industry, technology suppliers, officials from Govt of India, elite academia, counterparts from Bureau of Indian Standards (BIS) and Director General-NCB.



In the latest meeting held on 6<sup>th</sup> March 2019, project progress was reviewed for 17 ongoing R&D projects. Moreover, six new project proposals were proposed to be taken up from FY 19-20. During technical discussions, much valuable advices were received from all dignitaries like Sh Zakaria Khan Yusufzai (*SDO, DPIIT, MoCI, Govt of India*), Shri Ashwani Pahuja, Shri Sanjay Pant (*BIS*), Shri Avdhesh Singh (*Ultratech Cement*), Shri B C Pandey (*Ambuja Cement*), Sh A S C Bose (*India Cement*), Dr. S K Handoo (*CMA*), Director-CBRI, CMD-NRDC, Director-CMRS, Sh G C Mishra (*Director- A K S University*) to name a few. DG-NCB is thankful to all members of RAC for giving their inputs for the proposed R&D projects which NCB has envisioned to take during the upcoming years.



## Completed R&D Projects 18-19

Improving the Reactivity of Fly Ash and its Effect on Cement and Concrete Performance

Cost Effective Technology for Low Traffic Volume Concrete Roads

Application of CFD in Indian Cement Industry

Impact of Ammonia on Environment due to use of Ammonia for secondary abatement of NO<sub>x</sub> control in Cement Industries in India

## Sanctioned Projects

Investigation on performance of PPC and PSC utilizing high MgO clinker

Development of Portland Composite Cement based on fly ash and limestone

Performance validation of Portland Limestone Cements utilizing clinker and limestone from different regions of the country

## Proposed Projects

Development of fly ash based Oil Well Cement (OWC)

Application of solar thermal energy in cement industry

Carbon Capture and Utilization by integration of Calcium looping and Methanol generation for cement industry

## Release of Compendium- The Cement Industry India 2018



Hon'ble Minister of Commerce & Industry and Civil Aviation, Shri Suresh Prabhu released the Compendium on "The Cement Industry - India 2018" at Rajiv Gandhi Bhawan, New Delhi on 5<sup>th</sup> February 2019. The compendium prepared by NCB in association with Department for Promotion of Industry and Internal Trade (*DPIIT*) contains key information about technology development, challenges & opportunities for Indian cement industry along with an exhaustive directory of cement plants in India, beneficial to cement industry, policy planners, OEMs, academicians etc.

Hon'ble Minister emphasized the vital role cement industry plays towards growth and economic development of the country and commended the

industry's focus towards improving energy efficiency in plant operations. He urged NCB and all the stake holders to think of recycling material used in production of cement. The book release event was attended by senior officials from Ministry of Commerce and Industry (*MoC&I*), cement companies, Cement Manufacturers Association and NCB,





DG-NCB chaired “Interactive meet with cement Industry” in Feb 2019 at Hyderabad and interacted with cement industry professionals from various plants in southern part of India to fine tune and align NCB’s research and innovation activities with the present needs of the Industry.

DG-NCB carrying out discussions with Technical team of Ambuja Cements Ltd. in February 2019 in Mumbai to understand the present requirements related to research and innovations as well as training needs of the cement industry related to areas such as cement quality, cement products, process technology and optimization, alternative fuels, energy management and environmental issues.



DG-NCB carrying out discussions with Technical team of Ultra Tech Cements Ltd. in February 2019 in Mumbai.

## MoU with Oman Cement Company, Muscat



Oman Cement Company (SAOG), a company set up under provisions of Commercial Companies Law of the Sultanate of Oman and NCB signed a Memorandum of Understanding, on 06<sup>th</sup> February 2019. Oman

Cement Company (OCC), is a leading cement producer in Oman and is one of the global pioneer in Oil Well Cement manufacturing. OCC has signed this MoU with NCB for meeting core objectives of reducing cost of production as well setting up state of the art R & D centre in Oman in collaboration with NCB and carry-out R&D activities in the field of cement and building materials and similar related areas.

A three-member team under leadership of DG –NCB alongwith visited Oman Cement Company in the month of March 2019.

OCC appreciated the key inputs it received from NCB during the visit and expressed to continue a long relationship with NCB with an aim to benefit cement and concrete fraternities in Oman and India.



## Interactions with Academic Institutions



DG-NCB was invited to One day Workshop on “**Total Quality Management in Civil Engg**” organized by Civil Engineering Department of Kakatiya Institute of Technology & Science (KITS), Warangal, Telangana in March 2019. DG-NCB delivered a lecture on “Total Quality Management” to the faculty and Post Graduate students of KITS.



DG-NCB visited National Institute of Technology, Warangal (NITW), Telangana in March 2019 to

interact with Director (Actg) & Senior faculty of NITW to bring Industry, research organizations and academic Institutions together for technology transfer.



Representatives of Manav Rachna University had discussions with DG-NCB for exploring the idea of empanelment of

NCB experts as faculty at Manav Rachna University in various Engineering and scientific departments.





# Interactions with Allied Sectors



DG NCB Chairing the meeting with Sh Subrahmaniyam Kokkonda Director – Operations, Patil Group to explore the possibilities of using NCB facilities and expertise for improving life of Railway Sleepers



DG- NCB was invited as Guest of Honour in the workshop cum training program on “Treatment and Utilization of Industrial and Mining Wastes for Sustainable Environment” in January 2019 organised by CSIR- Institute of Materials Management Technology (IMMT), Bhubaneswar in collaboration with Department of Science and Technology (DST), Govt. of India where he highlighted the necessity and importance of recycling industrial and mining wastes for value added cement and building materials for sustainable development.

## Technical trainings at NCB



A two day short term training program on “Role of Construction Chemicals on Performance of Cements” at NCB-Ballabgarh in March 2019.

Three days Special Group Training Programme on Energy Audit and Conservation for the Engineers of M/s Reliance Cement Company Private Limited in January 2019



Five Days Training Programme titled Quality Control and Quality Assurance in Concrete Construction for the Engineers of DMRC



A RSC-DCPPAI Training Programme on “Management of Air Pollution in Pulp & Paper Industry” organized by Central Pulp & Paper Research Institute (CPPRI), Sahranpur at NCB Ballabgarh was inaugurated by Dr B P Thapliyal, Director-CPPRI, Dr B N Mohapatra, DG-NCB and Sh A Saxena-Head of Centre-NCB.



Five days training programme in January 2019 on Building materials and Testing for B.Tech. (Civil) students of J C Bose University, YMCA, Faridabad was concluded, DG NCB & Dr M L Agarwal, Chairperson of Civil Engineering of the University also graced the occasion.



DG, NCB visited India International Convention and Expo Centre (IICC), the prestigious world class Convention Centre under the aegis of DPIIT coming up at Dwarka and reviewed the progress of Third Party Quality Assurance works in January 2019



DG- NCB visited NCB Hyderabad Unit in February 2019 and interacted with the officials regarding activities being carried out at the unit, conducted visit in laboratories and discussed opportunities for enhancing services and for capacity building.



Internal communication from top management is a Monthly meeting initiative by DG-NCB which is held at end of every month at NCB Ballabgarh unit. All teams either statutory or technical are recognized and applauded and the achievements. All Units of NCB actively participate in the meeting through Video Conferencing.

## Forum for Science & Technology (FST)



Prof. Dr Dhanada Kanta Mishra, visiting research scholar at Hong Kong University of Science and Technology delivered a talk on “High Volume Fly ash Applications in India and China for Climate Change Mitigation” in the Forum for Science and Technology of NCB in March 2019. The talk was well received by the audience which included the scientists and engineers of Ncb as well as trainee interns from various educational institutions like BITS-Pilani and Amity Noida.

DG-NCb graced the forum with heads of centers and services of NCB.

***For training related queries please contact***

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NCB is well equipped with State -of-the-Art Testing Equipments for Physical, Chemical and Mineralogical Analysis of Raw Materials, Cement and Concrete in its Advanced Laboratories located at Ballabgarh (Delhi NCR), Hyderabad and Ahmedabad (INDIA)





Sl. No.	Title of the Course with Reference No.	Duration / Date	Venue
3	Use of Blended Cements for Durable Concrete (CCE-02/STC-7/Conc/H/2019)	2 days 11-12 June 2019	NCB-H
4	Advances in Concrete Technology (CCE-02/STC-9/Conc/B/2019)	3 days 18-20 June 2019	NCB-B
5	Cracks and Leakages in Concrete Structures: Causes, Prevention and Repair (CCE-02/STC-11/Conc/H/2019)	2 days 09-10 July 2019	NCB-H
6	Quality Control and Quality Assurance in Concrete Construction (CCE-02/STC-13/Conc/B/2019)	5 days 15-19 July 2019	NCB-B
7	Concrete Mix Design and Acceptance Criteria of Concrete (CCE-02/STC-16/Conc/B/2019)	3 days 31 July-02 August 2019	NCB-B
8	Corrosion in Reinforced Concrete Structures and its Remedial Measures (CCE-02/STC-20/Conc/H/2019)	2 days 05-06 September 2019	NCB-H
9	Non-destructive Testing and Evaluation of Concrete Structures (CCE-02/STC-21/Conc/B/2019)	3 days 18-20 September 2019	NCB-B
10	Use of Blended Cements for Durable Concrete (CCE-02/STC-26/Conc/B/2019)	3 days 16-18 October 2019	NCB-B
11	Concrete Mix Proportions and Acceptance Criteria (CCE-02/STC-29/Conc/H/2019)	3 days 20-22 November 2019	NCB-H
12	Design, Construction and Quality Control Practices for Concrete Roads for Highway & Low Volume Roads (CCE-02/STC-32/Conc/B/2019)	3 days 15-17 January 2020	NCB-B
13	Quality Control and Quality Assurance in Concrete Construction (CCE-02/STC-33/Conc/H/2019)	2 days 28-29 January 2020	NCB-H
14	Repair and Rehabilitation of Concrete Structures (CCE-02/STC-35/Conc/B/2019)	3 days 05-07 February 2020	NCB-B
15	Durability & Service Life Design of Concrete Structures (CCE-02/STC-36/Conc/B/2019)	2 days 26-27 February 2020	NCB-B
16	Non-destructive Testing and Evaluation of Concrete Structures (CCE-02/STC-38/Conc/H/2019)	2 days 05-06 March 2020	NCB-H
<b>III SIMULATOR BASED COURSES (SBCs)</b>			
1	Operation, Control and Optimization of Modern Grinding System based on Roller Press and Ball Mills (CCE-02/SBC-1/Sim/B/2019)	3 days 21-23 May 2019	NCB-B
2	Operation, Control and Optimization of Modern Precliner Kilns (CCE-02/SBC-2/Sim/B/2019)	4 days 18-21 June 2019	NCB-B
3	Operation, Control and Optimization of Modern Grinding System based on Vertical Roller Mills (CCE-02/SBC-3/Sim/B/2019)	3 days 07-09 August 2019	NCB-B
4	Operation, Control and Optimization of Modern Precliner Kilns (CCE-02/SBC-4/Sim/H/2019)	4 Days 27-30 August 2019	NCB-H
5	Operation, Control and Optimization of Modern Grinding System based on Roller Press and Ball Mills (CCE-02/SBC-5/Sim/B/2019)	4 days 24-27 September 2019	NCB-B
6	Operation, Control and Optimization of Modern Precliner Kilns (CCE-02/SBC-6/Sim/B/2019)	3 days 06-08 November 2019	NCB-B
7	Operation, Control and Optimization of Modern Grinding System based on Vertical Roller Mills (CCE-02/SBC-7/Sim/B/2019)	3 days 11-13 February 2020	NCB-B
8	Operation, Control and Optimisation of Modern Grinding Systems based on VRM and Roller Press / Ball Mill system (CCE-02/SBC-8/Sim/H/2019)	4 Days 25-28 February 2020	NCB-H
<b>IV CONTACT TRAINING PROGRAMMES (CTPs)</b>			
<i>Contact programmes are designed to suit the specific requirements of individual participants. These are practice-oriented wherein the participants practice in the laboratory right from day one to master the relevant technique/method of testing and analysis.</i>			
1	Application of XRD for Quality Evaluation of Clinker, Cement and Raw Materials	3 Days	NCB-B/ NCB-H
2	Mineralogical and Microstructural Evaluation of Coarse and Fine Aggregates, Hardened Concrete, Hydrated Cement by Optical Microscopy	3 Days	NCB-B/ NCB-H
3	EDTA Methods of Analysis for Cement and Raw Materials	3 Days	NCB-B / NCB-H
4	Estimation of Free Silica	3 Days	NCB-B / NCB-H