

12TH NCB INTERNATIONAL SEMINAR, NEW DELHI/INDIA (15.-18.11.2011)

International conference on cement and building materials

Original press release of the NCB INDIA



Source: NCB

A section of the audience: more than 800 participants visited the NCB seminar in 2011

The 12th NCB International Seminar on Cement and Building Materials, held from 15th to 18th November 2011 at The Ashok, New Delhi, received overwhelming participation of more than 800 delegates including 92 delegates from overseas countries – Austria, Bangladesh, Bhutan, Brazil, Canada, China, Denmark, Egypt, France, Germany, Indonesia, Italy, Japan, Malaysia, Kenya, Netherlands, Norway, Switzerland, Turkey, UK etc. The seminar was a great success in terms of participation of delegates, technical content of papers presented, technical exhibition as well as the sponsorships.

The seminar as well as the technical exhibition were inaugurated by Shri Talleen Kumar, Joint Secretary, Department of Industrial Policy & Promotion (DIPP), Ministry of Commerce and Industry, Govt. of India. The presidential address was delivered by Smt. Vinita Singhania, Managing Director JK Lakshmi Cement, President-CMA and Chairperson-NCB. The keynote address was delivered by Shri Ashwani Pahuja, DG, NCB.

Delivering his **inaugural address**, Shri Talleen Kumar, stated that the Indian cement industry has outpaced the growth rates of other prominent industries in the country, due to the growing demand from the housing sector, increased activity in infrastructure development and exports recovery. Despite the recession, the Indian cement industry enhanced its production to 228 million tonnes in 2010-11. The strong growth witnessed over the years was also an opportunity for the industry to infuse the latest technologies and achieve a quantum leap in productivity and efficiency apart from increasing the capacity of single production lines, resulting in improved economies of scale.

Shri Talleen Kumar further mentioned that since the cement industry is energy intensive and releases high CO₂ emissions per tonne of cement produced, the biggest challenge today for the Indian cement industry is sustainability. The industry's efforts towards control of emissions, preservation of ecology and voluntary initiatives such

as Corporate Responsibility for Environmental Protection are laudable. The Indian cement industry deserves commendation for its long-standing efforts towards reduction of its carbon footprint by adopting the best technologies and manufacturing practices. This is reflected in the industry's CO₂ emission of 0.82 tonne per tonne of cement from a substantially high level of 1.12 in 1996.

He commended the efforts of cement industry for using waste materials like flyash. The initiatives taken by Indian cement industry towards waste utilization were evident from the fact that production of blended cements in the country in the year 2010-11 was as high as 75% as against only 36% in 2000-01. He further stated that there was substantial scope for enhancing the utilization of wastes, particularly hazardous and combustible wastes and expressed confidence that the industry will soon acquire international best practices of waste utilization for sustainable development. He

also mentioned that systems for co-generation of power through waste heat recovery and technologies for low NO_x and SO₂ emission have substantial Greenhouse Gases (GHG) reduction potential and hoped that these would soon find implementation in big way.

Emphasizing the role of R&D Institutions like the National Council for Cement and Building Materials (NCB) in developing and promoting newer technologies and materials for performance enhancement, cost reduction and durable construction he expressed confidence that the cement industry along with the NCB would continue to strive to meet the legitimate aspirations of its constituencies and fulfill its responsibilities to the nation.

On this occasion, Shri Talleen Kumar also released a special publication entitled Indian Cement and Construction Industry Outlook and Vision 2020 which contains up-to-date technical articles on specific themes by eminent experts and was published at the Inaugural Session. An Exhibitors' Directory was also released on this occasion.

The **presidential address** of Smt. Vinita Singhania pointed out that the cement industry had achieved spectacular results in terms of energy conservation and environmental improve-



Source: NCB

Dignitaries on dais: (l to r) Dr S C Sharma, Joint Director, NCB; Shri Ashwani Pahuja, Director General, NCB; Chief Guest Shri Talleen Kumar, Joint Secretary-IPP, Govt. of India; Smt. Vinita Singhania, Managing Director JK Lakshmi Cement, President-CMA and Chairperson-NCB, A Venkatasubramanian, General Manager-NCB

ment. The quality of cement produced in the country is also among the best in the international market. It was important that the industry continued to adopt pragmatic and well-considered strategies that would contribute to further improving productivity and quality and cutting costs. With a strong R&D base in the form of the NCB as well as in-house R&D facilities set up by some of the cement companies, the industry is in a position to quickly adopt new innovations and to always be on par with best international practices in cement manufacture. The role of R&D in the growth of the cement industry in India, whether for cost reduction, conservation of energy and materials, environmental improvement, quality improvement or for rational utilization of the product can not be over emphasized. Today's fast moving world is facing new challenges to its progress and no industry can grow without R&D support. Therefore, adequate funds have to be made available for a meaningful R&D.

It was mentioned that creating world class road infrastructure was one of the major thrust areas of the Government. Concrete roads offered several advantages, including long life and are practically maintenance-free. Concrete roads can withstand extreme weather conditions such as wide ranging temperatures, heavy rainfall and waterlogging. Several initiatives are required from Government and other departments to encourage adoption of concrete roads in the country to a large extent.

In his [keynote address](#), Shri Ashwani Pahuja, DG-NCB, presented a technological perspective of the cement industry, covering technological advancements, energy performance, environmental improvement, efforts towards sustainable development, emerging concrete technologies as well as NCB's



Source: NCB

Release of the special publication

contribution in these areas.

He mentioned that the joint investigations conducted by the NCB in association with other research organizations in the country dispelled all doubts about the suitability of PPC for RCC constructions from durability consideration. NCB was also associated with an Indo-Norwegian joint project, in collaboration with SINTEF Building and Infrastructure Norway, focusing on maximizing the use of mineral wastes such as flyash and bottom ash in cement and concrete production. He further stated that the cement industry has set its sight firmly on sustainable development through the three-pronged strategy of "conserve, recycle and renew" and expressed the confidence that cement industry along with the NCB would continue to strive to meet the challenges in this regard and will continue its voluntary pursuit of excellence and continue to make its contribution to the prevention of irreversible climate change.

The [valedictory address](#) was delivered by Dr Rajat Kumar, Director, Department of Industrial Policy and Promotion (DIPP),

Ministry of Commerce and Industry, Govt. of India during the concluding session of the seminar. National Awards for Energy Efficiency, Environmental Excellence and Quality Excellence in the Indian cement industry for the years 2009-10 and 2010-11 were also presented to the winning cement plants. Awards were also given to the ten best technical papers.

Delivering the valedictory address, Dr Rajat Kumar stated that latest state-of-the-art dry process plants in the country had energy consumption levels comparable to the world standards. However, a large number of plants installed before nineties were operating at relatively high energy consumption levels and there was a need for their modernization to bring their energy consumption levels on par with global standards.

While mentioning the efforts made by the cement industry by installing 80 MW of wind energy facility in the coastal region, the need for integrating alternate and renewable energy into the system was emphasized. He highlighted the importance of utilization of industrial wastes in cement manufacture and its

contribution to sustainable development of cement and construction industries.

He stated that it was important that the industry adopted pragmatic and well-considered approaches and evolved such methods which would contribute to further improvement in efficiency, productivity and quality and cut costs on materials and construction to enable it to continue fulfilling its vital role in rapid development and progress of country.

He further mentioned that application of nano-technology to cement and concrete should constitute a major thrust area of R&D for development of eco-friendly, high performance cement/binders and concrete with improved durability characteristics.

TECHNICAL SESSIONS

More than 80 technical papers were presented in 15 technical sessions including three special lectures. All topics relating to the cement and building materials industry were covered, such as for example:

- » Raw materials, waste-derived fuels and combustion systems



Source: NCB

Dr Rajat Kumar, Director-IPP, Govt. of India giving away the award for Energy Efficiency

- » Advances in plant & machinery
- » Modern trends in project engineering and system design
- » Productivity enhancement and process optimization
- » Portland, blended and special cements
- » Total quality management
- » Performance, durability and sustainability of concrete system
- » Emerging trends in building materials
- » Energy conservation
- » Environmental management and mitigation of global warming

The authors gave emphasis to issues related to all areas of cement manufacture, utilization of industrial byproduct wastes, use of low grade limestone, blended, newer and special cements, use of additives/admixtures, performance and durability of concrete as well as emerging trends in sustainable cements and building materials and construction practices.

Three special lectures by renowned experts were delivered on topical subjects viz., Alkali

Activation of Aluminosilicates by Prof. Donald E Macphee, University of Aberdeen, Scotland, U.K.; Portland Cements Containing different additives including Dolomite by Dr Wolfgang Dienemann, Heidelberg Cement, Germany and Service Life Prediction of Concrete Structures by Prof. Harald Justnes, SINTEF Building and Infrastructure, Norway.

Mine optimization using Multi-mine Scheduler software provided an optimum economical extraction sequence with minimum quality variation and an effective optimal pit/multi pit blending scheme.

Possible techniques for **improving limestone quality** such as beneficiation – crushing and screening and froth flotation and use of high grade limestone as sweetener were discussed to enable utilization of low grade limestone deposits in cement manufacture.

Utilization of **spent wash** from a distillery by the co-processing route, of organic sludge from the dye industry as an alternate fuel in cement kiln and of jaro-

site, a byproduct of zinc metal extraction by the hydro-metallurgical process as a set retarder in cement were highlighted. 3.5% heat substitution of spent wash was achieved. It was possible to substitute 80% of mineral gypsum by jarosite without affecting the properties of the cement mixture produced.

Approaches for **AFR co-processing** were presented. The whole process chain right from pre-processing and refining the potential AFR, storage, handling and dosing arrangements up to adaptation of calciner and burner was discussed. Safe and efficient handling of alternate fuels in cement kilns were discussed.

Features and operating experience of the **world's largest OK Mill**, large vertical mills and the MVR mill with multi drive system were presented. Up-gradation of closed circuit ball mill systems by the addition of high pressure grinding rolls and separator to existing ball mill was discussed.

Developments in **cross bar cooler** technology were presented

and its features, like modular concept, MFR's, ABC fixed inlet etc. were highlighted. The development in the cross bar cooler now offers horizontal transport of clinker, in place of earlier sloped transport of clinker. This arrangement increased the grate area in the same retrofitted area resulting in reduction of standard cooler loss and fan power consumption.

Upgradation of a 5000 tpd kiln (6.0m dia x 96.0m long) to 13000 tpd by substituting the SLC with a new ILC twin string low NO_x preheater tower and providing a new kiln drive, world's largest cross bar cooler and heavy roller crusher; new TAD; cooler vent system; ESP and fan was discussed.

Developments in **IKN cooling technology** with grate plates having the Coanda effect for high recuperation efficiency were presented. The linear pendulum system makes it mechanically maintenance free. A case study of operating parameters of the IKN cooler was presented.

Papers on the **Hazemag VARIO wobbler** for optimizing crushing operation, the COMPLEX comminution system for lowest consumption of electrical energy, Logic Q – a logistic application for the bulk solids and unit load industry, application of ultra-fine grinding technology for limestone, slag, cement and flyash and Temcor aluminum domes for covering limestone stockpiles were presented.

Simulation of separate line calciner and using commercial CFD solver was presented. The CFD model provided temperature, composition distributions and particle behavior. A paper on CFD simulations performed in raw mill, kiln and electrostatic precipitator (ESP) to study gas and solid particle flows was also presented.

An innovative way of **loading clinker from silo to rail wagon** was presented. A conventional method using telescopic chute results in dust emission due to erosion of the cone chute. This problem can be solved by replacing the conical chutes with fixed carbide line pipes.

Papers on **special high performance alumina bricks** for the cooler bullnose, new generation cement castables and MA-spinel bricks presented the latest developments in refractory products for the cement industry.

Papers on **upgradation of a ball mill** from 90 t/h raw meal to 220-230 t/h by addition of a roller press as pre-grinder with V and SKS separators was presented. Projects of upgrading kilns and installation of new medium size and high capacity kiln lines were also presented.

Increase of production in a coal mill while grinding petcoke by water injection was discussed. A thermodynamic and kinetic analysis was conducted to reveal the equilibrium concentration of the species for extreme operational temperature and pressure. Injection of water during grinding did not result in formation of water gas, which is explosive in nature.

Problems of the **gas conditioning tower** such as wet material formation and jamming of the screw conveyor were discussed. Installation of a set of baffles below the butterfly damper resulted in improved operation of the GCT.

Optimization of the roller press-ball mill circuit to enhance the cement production by modifications in V and SKS separators to facilitate flyash addition was presented. Minor adjustments in separators resulted in use of increased flyash, increased production, and reduced specific power consumption and consistent quality.



Source: NCB

Chief guest Shri Talleen Kumar, Joint Secretary-IPP, Govt. of India, inaugurating the exhibition

A paper on a fully automatic packing and loading unit to achieve continuous dispatching, shortest loading and waiting time for trucks, reduced maintenance costs and time and a safe operation was presented.

A paper on **high sulphur coal** highlighted approaches for fixing maximum sulphur in clinker phases. The role of minor constituents coming from low grade limestone was discussed. Papers on the addition of metakaolin to white Portland cement for improved performance and of spent catalyst from refineries as a possible additive to cement were presented.

A paper on **TQM** practices discussed strategies for achieving set targets and a paper on total quality control systems discussed design features of the system including robot-based sample preparation. Techniques for determination of ash and sulphur content in coal using XRF/XRD were presented. Use of XRF for analysis of hazardous elements, halogens and total cement and raw materials was also discussed.

The paper on **ultra fine admixtures** highlighted their role in enhancing concrete performance. The performance of M40 and M50 grade high volume flyash concrete was discussed. Papers on flyash based self compacting concrete and the role of chemical admixtures in blended cement and concrete were also presented. Field studies to determine carbonation rate and its effect on corrosion were discussed from the viewpoint of service life design of buildings.

A paper on **natural biocides for concrete** highlighted the absence of any adverse effect resulting from their use. Results on use of ground bottom ash and recycled concrete aggregates in concrete were presented and also the beneficial effects of using microsilica in ternary blends were discussed. The beneficial effects of air cooled steel slag and jarosite in accelerating the rate of clinkerization reaction were presented.



Source: NCB

Feedback from the industry during the conference

Papers highlighting the direct impact of **waste heat recovery** on efficiency of the process, the need for careful assessment of different operational scenarios for a new kiln line to establish the maximum realistic heat available for the integrated WHR system and on various aspects of installing WHR power plants (WHRPP) in the cement industry were presented.

A paper on the **Pyroclon calciner** with option of combustion chamber and multi channel Pyrojet and Pyrostream low NO_x burners was presented and highlighted their role in facilitating the utilization of alternative fuels. The state-of-the-art equipment for reducing GHG emissions; lesser energy consuming grinding systems and production of blended cements were discussed.

Benchmarking and audit; greening the cement under 7R philosophy; installation of WHR boiler; green belt development are some of the CO_2 management approaches that were discussed. Green fuel technology, low energy cement, nanotechnology, use of alternate binders are some of the technologies which are being pursued actively as long term solutions to mitigate GHG emissions.

Development of algal photo-bioreactor for CO_2 sequestration was presented. Studies were conducted to isolate algal strains from hot springs. A 100 lit photo-bioreactor for CO_2 sequestration was constructed and simulated flue gas was supplied. The inlet and outlet CO_2 concentrations were measured. The experiment proved that "Microcoleus SP 3.1" micro-algal strain can be successfully used for CO_2 sequestration.

A paper on **life cycle assessment** of buildings highlighted LCA as an effective tool to achieve sustainable commercial buildings. The functional unit for this LCA



Cultural highlights from different parts of India in the evening program

study was considered as per m^2 of the constructed area and all inputs/outputs across the system boundary were converted in terms of the functional unit. The study analysed a whole range of environmental impacts associated with commercial buildings due to consumption of materials and energy.

Energy and economic efficiency is the key to the sustainable development and future growth of the Indian cement industry. Almost all the lectures were well attended. The lively interest in the presentations was shown by the large number of questions at the end of the sessions and the enthusiastic discussions during the breaks. The presentations ranged from experiences gained from everyday work to highly theoretical papers, from

overviews on plant technology to individual and detailed solutions for specific problems.

EXHIBITION

Four **exhibition areas** were reserved for the technical exhibition, organized as a part of the seminar, consisted of about 90 stalls including display panels and gave an exposure to the latest developments in machinery, related auxiliaries and services available to the cement industry and provided an opportunity for a very useful interaction among machinery suppliers and users. The delegates were not only able to have an exposure to the latest technological developments internationally, but also had mutually fruitful interactions. The Exhibitors made extensive use of this opportunity for business activities and networking.

CONFERENCE PAPERS

A **kit bag** containing a copy each of the Extended Abstracts, CD of Proceedings, Special Publication and Exhibitors' Directory (printed booklet + CD) was provided to all delegates.

NEXT SEMINAR

The NCB seminar, 2011 offered all the participants a splendid opportunity for technical-scientific and economic exchange. **The next seminar is scheduled for 2013.**

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