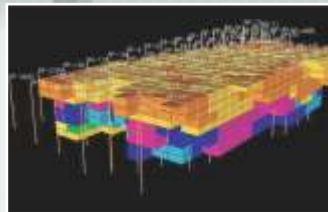


Centre for Mining, Environment, Plant Engineering and Operation



NATIONAL COUNCIL FOR CEMENT AND BUILDING MATERIALS

Under the Administrative Control of Ministry of Commerce & Industry, Government of India



Geology, Mining and Raw Materials

SERVICES OFFERED

- ☞ Identification of Suitable Limestone Deposits
- ☞ Survey and Geological Mapping
- ☞ Planning, Supervision and Monitoring of Exploration
- ☞ Computer Aided Deposit Evaluation, Mine Planning and Production Scheduling
- ☞ Strategy Planning and Sensitivity Analysis for Single or Multi Limestone Mine
- ☞ Technical Audit of Open cast Limestone mines
- ☞ Lab Scale Beneficiation Studies of Low/Marginal Grade Limestone

STUDIES UNDERTAKEN

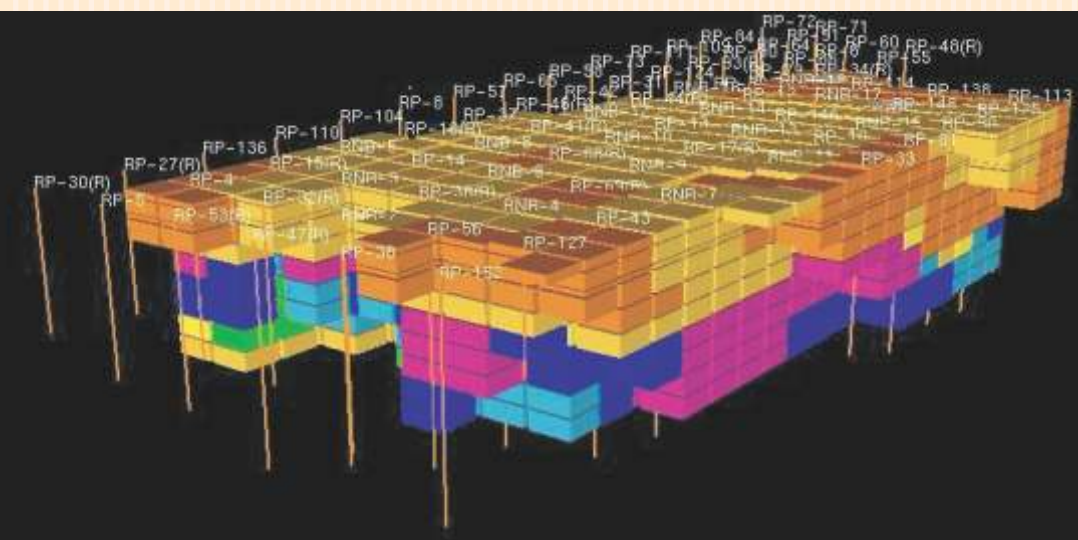
- Identification and Technical Appraisal of Potential Limestone Deposit for New Projects
- Survey, Geological Mapping and Supervision of Exploration
- Computer Aided Deposit Evaluation, Mine Planning and Production Scheduling
- Preparation of Mining Plan as per IBM Guidelines for Grant/Renewal of Mining Lease
- Re-assessment of Limestone Reserves of Operating Mines

- Beneficiation and Upgradation of Mines Reject and Marginal Grade Limestone for Cement Manufacture
- Updating of National Inventory of Cement Grade Limestone Deposits of India
- Raw Material Availability vis-à-vis Eco-friendly Exploitation in Non-cluster Regions for Future Growth of Cement Industry



Drilling Operation in Progress in Overseas Project

- Norms for Proving of Limestone Deposits for Cement Manufacture
- Integration of Computer Aided Deposit Evaluation and Mine Planning Software for Optimizing Run-of-Mine Quality Control in Limestone Quarries
- Field Trials for Geophysical Prospecting Techniques for Limestone Exploration
- Quarry Planning System Design for use of Continuous Surface Miner for Productivity Enhancement and Quality Control



3D Deposit Model of Limestone Classified Various Grade Unit Blocks

Environmental Management

STUDIES UNDERTAKEN

- Measures for Reduction of Global Warming Contributed by Indian Cement Industry
- Assessment of Plant level Emission and Strategies for Reducing CO₂ Emissions in the Cement Industry
- Vulnerability and Adaptation Assessment of National Eco system. A Case Study of Vulnerability Parameters in Kachchh District
- Development of Environmental Standards for Refractory Industry
- Development of Comprehensive Industry Document (COINDS) on Mini Cement Plants
- Sustainable Development Plan for Environment Protection of Kachchh District, Gujarat
- Use of Alternate Waste Derived Fuels in Indian Cement Industry
- EIA and EMP Studies for Limestone Mines of Cement Plants
- Life Cycle Assessment for Cement & Construction Sector
- Upgradation of Plant Capacity and its Environmental Impact
- Overseas Project : EIA & EMP for South African Greenfield Project of 1 MTPA Capacity Cement Plant
- Developmental Studies in the Area of Hazardous Waste Management
- Environmental Auditing in Cement Plants
- Development of Comprehensive Norms for Environmental Improvement in Cement Industry
- Development of Environmental Management Systems (EMS) for Indian Cement Industry

EQUIPMENT/FACILITIES AVAILABLE

- Continuous Monitoring System • CO Analyser • BTX Hydro Carbon Analyser • Chemiluminescence NO_x Analyser • SO₂ Fluorescent Analyser • PM_{2.5} Ambient Dust Sampler • Micro Meteorological Monitor • Automatic Stack Monitoring Sampler • Sound Level Meter • Portable Flue Gas Analyser • Blastmate Series-II • Stack Monitoring Kit • Respirable Dust Sampler • High Volume Air Sampler

SERVICES OFFERED

- ☞ Control of Particulates and Gaseous Emissions
 - ☞ Pollution Load Assessment of Plant and Mines
 - ☞ EIA and EMP for Greenfield and Brownfield projects
 - ☞ Hazardous Wastes as Alternate Fuel
 - ☞ Climate Change and Global Warming
 - ☞ Land Use and Water Resources
 - ☞ Environmental Audit
 - ☞ Life Cycle Assessment
- Environmental Protection through Improvement in Blasting Techniques in Limestone Mines
 - Improvement in Environmental Control in Cement Plants
 - Evaluation of Filter Media for Fabric Filters for Cement Industry
 - Reduction in Dust Generation in Cement Plants
 - Reduction in Noise Pollution in Cement Plants
 - Assessment of Environmental problems in Lime Industry
 - Development of Comprehensive Norms for Environmental Improvement in Cement Industry including Impact of Dust Emission on Ambient Air Quality
 - Techno-economic Study of various available Dust Control Equipment for Cement Rotary Kiln
 - Formulation of Guidelines for Selection and Operation of Coal Mill Dust Collection Systems to avoid Frequent Fire and Explosion
 - Ground Water Management in and around Surface Mining Project



Process and Productivity

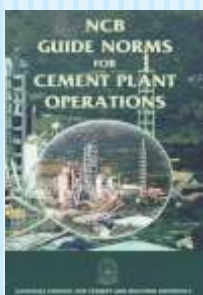
SERVICES OFFERED

- ☞ Long-term Productivity Enhancement Studies
- ☞ Diagnostic Studies : High PH Exit Gas Temperature, Kiln Shell Corrosion, Unstable Combustion/Burning of Fuel, Coating Formation/Build-up in Kiln System, Lump Formation in Cement Silos
- ☞ Process Optimization Studies on Mills, Separators and Kilns
- ☞ Rational Utilisation of Alternate Fuels & Improvement in Fuel Combustion Efficiency
- ☞ Use of Hazardous Combustible Wastes
 - Characterisation including Quantification of Heavy Metals
 - Impact on Combustion, Kiln Operation, Product Quality and Environment
 - Factors Governing Size and Extent of Utilisation
 - System for Feeding & Firing in the Kiln System
 - Techno-economic Viability

STUDIES UNDERTAKEN

- Technical Feasibility Study on use of spent wash from distillery in Cement Kiln
- Techno-economics of using Waste Tyres as part Substitute of Coal in a 6000 TPD Kiln
- Plant Trials with ETP Sludge as Fuel along with Coal in a 2800 TPD Kiln
- Techno-economic Viability of using Natural Gas in place of Coal in a 1.5 MTPA plant
- Establishing Extent of Pet Coke Utilization in a 1200 TPD Plant and Study its Impact on Kiln Performance, Product Quality and Environment

NCB GUIDE NORMS FOR CEMENT PLANT OPERATIONS



Cover Page of 5th edition of NCB Guide Norms

Key Features of Fifth Edition :

- Consequential changes in technology and operational practices in cement industry
- Comprehensive norms on energy and operational parameters for various prevalent systems in different sections of cement

- manufacturing process
- Norms for pet coke grinding
- Norms on VRM for cement grinding
- Experience sharing on Co-processing of hazardous combustible wastes
- Energy consumption profile of Indian cement industry

NEW FACILITIES ADDED

Versatile Simulation Package

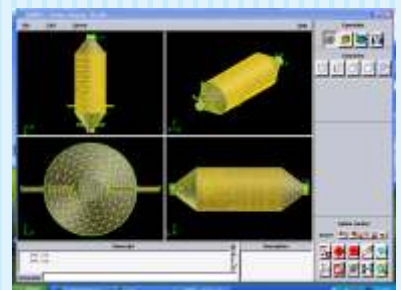
Process optimisation through simulation of:

- Vertical roller mills for raw material, coal as well as cement grinding.
- Roller press–ball mill systems for raw material and cement grinding.
- Separate Line Calciner (SLC) / In Line Calciner (ILC) kiln with 4/5/6 stage preheater and conventional / modern grate cooler.



Computational Fluid Dynamic Software

- Analysis of the Complex Flow Structures (Typical of cyclone, burner and calciner)
- Design optimization
- Assessment of the suitability of alternate fuels in calciners.



Computational Fluid Dynamic (CFD) Software

Energy Management

STUDIES UNDERTAKEN

- Energy Audit Studies in Cement Plants - 170 Studies (1984-2011)
- Techno-economic Feasibility Studies for Retrofitting Energy Efficient Equipment/Systems in Cement Plants

EQUIPMENT / FACILITIES for Process Diagnostics and Energy Audit

- Gas analysers – O₂, CO, CO₂
- Temperature measuring instruments – contact & non-contact
- Flow measuring instruments – pitot tube, micro manometer, vane anemometer
- Pressure measuring instruments – micro manometer
- Ultrasonic gas leak detector
- Electrical instruments – amps, volts, power, power factor



Measurement of Electrical Parameters with Clamp-on Power Meter

POTENTIAL SAVINGS IN SOME TYPICAL PLANTS

PLANT	KILN(S) CAPACITY (tpd) AND PROCESS	POTENTIAL SAVINGS		
		THERMAL ENERGY kcal/kg cl	ELECTRICAL ENERGY kWh/t cem	ANNUAL COST Rs. Lakh
A	1200 tpd, 6-ST, RSP CALCINER	35	0.78	98
B	• 1200 tpd, 4-ST, SP KILN	50	1.94*	281
	• 1200 tpd, 4-ST, SP KILN	43.1		
C	• 1750 tpd, 5-ST, PH WITH NMFC	36.5	4.08	362
	• 1750 tpd, 5-ST, PH WITH NMFC	35.4		
D	• 3800 tpd, 4-ST, PH & ILC	13	4.43	269
E	• 2800 tpd, 6-ST, SP & SLC	5	4.74	187
	• 3800 tpd, 6-ST, SP & ILC	10	6.24	365
F	• 1800 tpd, PSC BASED GRINDING UNIT WITH VRM	-	4.72	95

* kWh/t CLINKER

SERVICES OFFERED

- ☞ Energy Audit Studies in Cement Plants
- ☞ Energy Monitoring and Motivation for Competitive Improvement : National Awards for Energy Efficiency in Indian Cement Industry since 1986-87
- ☞ Technological and R & D Support for Energy & Operational Efficiency, Fuel Substitution etc
- ☞ Heat Balance Studies
- ☞ Gas Balance Studies
- ☞ Techno-economic Feasibility Studies for Cogeneration of Power through Waste Heat Recovery in Cement Plants
- ☞ Energy Awareness Activities:
 - Training Programmes, Workshops, Seminars etc.
 - Publications
 - Technology Digests
 - Newsletters

NCB is accredited with Bureau of Energy Efficiency (BEE) as Energy Auditor under Energy Conservation Act-2001.



Measurement of Shell Temperature with Radiation Pyrometer



Pressure Measurement with Micro - manometer

Plant Maintenance

SERVICES OFFERED

- ☞ Maintenance Audit
- ☞ Hot Kiln Alignment (HKA) Study
- ☞ Kiln Shell Profile Evaluation
- ☞ Compressed Air Audit
- ☞ Total Productive Maintenance (TPM)
- ☞ Designing Plant Maintenance Management System
- ☞ Condition Monitoring Services
- ☞ Inventory Control System
- ☞ Computerised Maintenance System
- ☞ Safety Audit
- ☞ Performance Audit of Heavy Earth Moving Equipment

FACILITIES AVAILABLE

- Hot Kiln Alignment Equipment
- Laser Beam Shell Profile Measurement Equipment
- Vibration Analyzer and Data Collector
- Opta-align - Laser based Shaft Alignment Equipment
- Shock Pulse Meter and Bearing Analyser
- Oil Test Kit

INVENTORY CONTROL SYSTEM

For reduction of inventory level and inventory carrying cost. Carried out 3 such studies for large cement plants.

HOT KILN ALIGNMENT TECHNOLOGY

To improve the mechanical stability of kiln system. Hot Kiln Alignment studies on 29 kilns in cement, alumina, sponge iron, paper plant in India and overseas countries completed.

SHELL PROFILE MEASUREMENT

A deformed shell causes damages to the lining and subsequent shell deviations, necessitating replacement of a part of the kiln shell. NCB has conducted 28 studies in India and overseas.

MAINTENANCE AUDIT

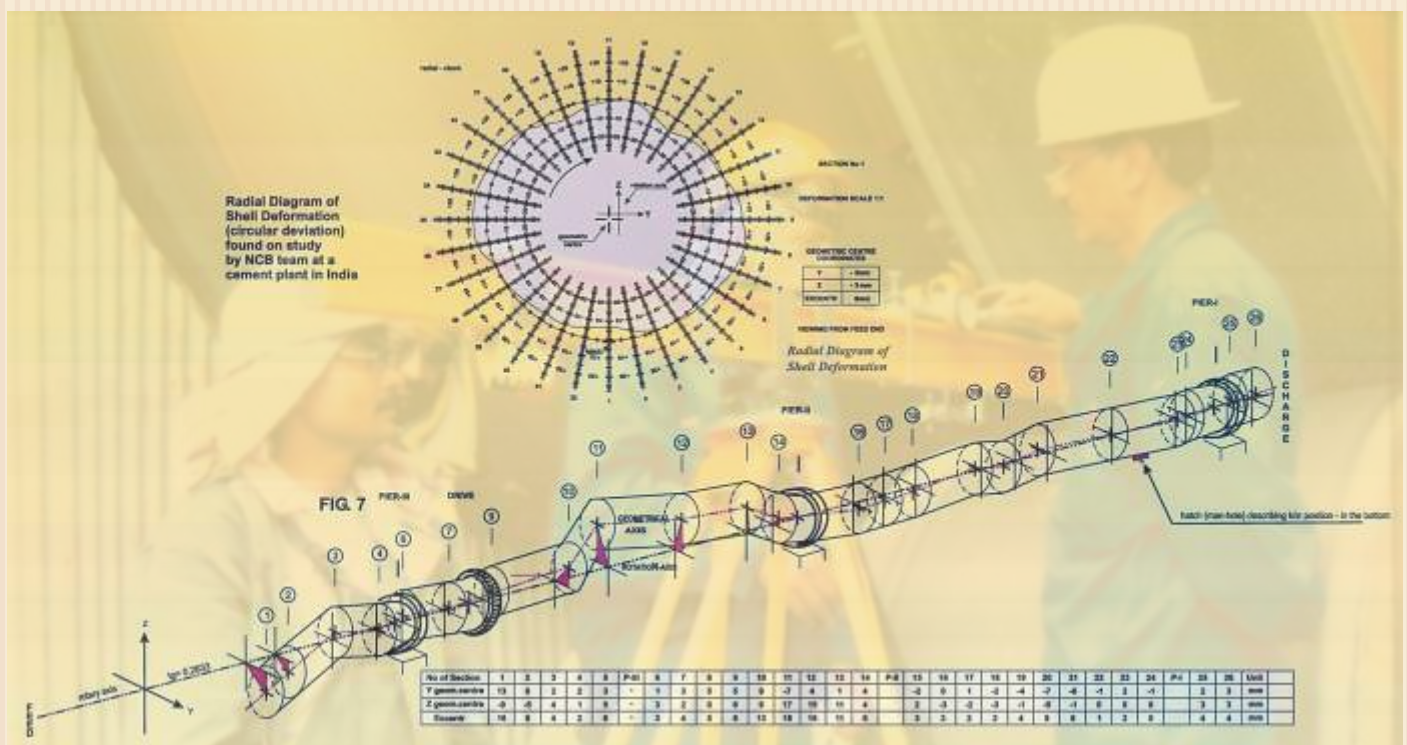
To provide current maintenance status, maintenance performance measurement, suggesting improvements in maintenance functions and developing best practices. NCB has carried out 11 similar studies for large cement plants.

COMPRESSED AIR AUDIT

For ensuring optimum utilization of compressed air to reduce operating costs. NCB has carried out 34 such studies, indicating potential savings in the range of 50 to 400 kW per cement plant.

TOTAL PRODUCTIVE MAINTENANCE

To optimize equipment effectiveness, reducing breakdowns, and promoting autonomous maintenance by operators.



Project Engineering & System Design

STUDIES UNDERTAKEN

- TEFR for 3 MTPA Cement Projects in Karnataka, Gujarat and Rajasthan
- TEFR for 2 MTPA Clinkerisation units in Gujarat and Rajasthan
- TEFR for 1 MTPA Cement Project in Nagaland
- TEFR for 2 MTPA Cement Grinding Unit in Maharashtra
- Techno-Economic Viability study of:
 - 1 MTPA Cement Plant
 - 1.4 MTPA Cement Plant
- Assessment of expansion project of:
 - 1.2 MTPA Cement Plant
- Preparation of detailed project report for existing three units for capacity enhancement from 1 MTPA each to 1.6 MTPA each and setting up a new clinkerisation unit of 1.6 MTPA capacity
- 105 Nos. CRI-MVSK Mini Cement Plants commissioned

SERVICES OFFERED

- ☞ Concept to commissioning of greenfield cement plant covering :
 - Prefeasibility Study
 - Techno-economic Feasibility Report (TEFR)
 - Detailed Project Report (DPR)
 - Project Management
- ☞ Preparation of Tender Document and Evaluation of Bids for Main and Auxiliary Equipment
- ☞ Techno-economic Study for Plant Rehabilitation Schemes
- ☞ Assessment of Plant Capacity
- ☞ Studies Relevant to Corporate Debt Restructuring



NCB Cad Centre

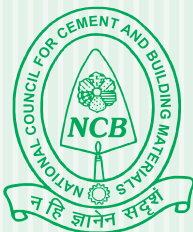


OUR VALUED CUSTOMERS

- The ACC Ltd.
 - Bargarh Cement Works
 - Chanda Cement Works
 - Gagal Cement Works
 - Jamul Cement Works
 - Kymore Cement Works
 - Lakheri Cement Works
 - Madukkarai Cement Works
 - Sindri Cement Works
 - Tikaria Cement Works
 - Wadi Cement Works
 - Ambuja Cements Ltd.
 - Bhatapara Plant
 - Darlaghat Unit
 - Gujarat Unit
 - Maratha Unit
 - Bharat Aluminium Ltd. Korba
 - Bihar Sponge Iron Ltd., Chandil
 - Binani Cement Limited, Sirohi
 - Birla Corporation Ltd.
 - Birla Cement Works & Chanderia Cement Works
 - Birla Vikas Cement, Satna
 - Satna Cement Works, Satna
 - Bureau of Energy Efficiency
 - Cairn Energy
 - Central Pollution Control Board
 - Century Cement
 - Grasim Industries Ltd., (Cement Business)
 - Aditya Cement
 - Grasim Cement (Chhattisgarh)
 - Grasim Industries Ltd.
 - Rajashree Cement
 - Vikram Cement
 - The India Cements Ltd.
 - Chilamkur Factory
 - Sankarnagar Factory
 - Vishnupuram Factory
 - Yerraguntla Factory
 - Lafarge India Pvt. Ltd.
 - Arasmeta Cement Plant
 - Jaiprakash Associates Ltd. (Cement Division)
 - Jaypee Nagar
 - Jammu & Kashmir Cements Ltd.
 - Khrew Cement Factory
 - JK Cement Works
 - Nimbahera Plant
 - JK Lakshmi Cement
 - Kalyanpur Cements Ltd.
 - Kesoram Cement
 - Maihar Cement
 - Mangalam Cement Ltd.
 - Manikgarh Cement
 - Mawmluh-Cherra Cements Ltd.
 - Ministry of Environment & Forests
 - Murli Industries Ltd.
 - My Home Industries
- Nagaland Mineral Development Corp. Ltd.
 - OCL India Ltd.
 - Penna Cement Industries Ltd.
 - Reliance Energy Ltd. (Formerly BSES)
 - Sanghi Industries Ltd.
 - Saraswati Power & Industries (P) Ltd.
 - Saurashtra Cement Ltd.
 - Shree Digvijay Cement Company Ltd.
 - Shriram Cement Works
 - Shree Cement Ltd.
 - Tata Sponge Iron Ltd.
 - UltraTech Cement Ltd.,
 - Tadipatri & Awarpur Plant
 - Vasavadatta Cements

OVERSEAS

- Cement Company of Northern Nigeria PLC. Sokoto
- FAB Cement (Pty.) Ltd. South Africa
- German Technical Cooperation (GTZ)
- Gulf Cement Company, Qatar
- Kuwait Cement Co., Kuwait
- Libyan Cement Company, Benghazi, Libya
- Mafikeng Cement (Pty.) Ltd. South Africa
- Penden Cement Authority Ltd., Gomtu, Bhutan
- Raysut Cement Co., Oman
- Shandong Binani Rongan Cement Co. Ltd. China
- East African Portland Cement Co., Kenya



For further details please contact:

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