



ENGINEERS INDIA LIMITED

MINING & METALLURGY

Integrated Engineering & Project Management Solutions



PROFILE

Engineers India Ltd. (EIL) is a leading global engineering consultancy and EPC company. The Company has a diverse portfolio comprising Hydrocarbon, Chemicals & Fertilizers, Mining & Metallurgy, Infrastructure, Water and Waste Management, Solar & Nuclear Power sectors.

EIL has emerged as a 'Total Solutions' engineering consultancy company providing design, engineering, procurement, construction and integrated project management services from 'Concept to Commissioning' with highest quality and safety standards. It also provides specialist services such as heat and mass transfer equipment design, environmental engineering, specialist materials and maintenance and plant operations and safety services.

Over the past five decades, EIL has executed more than 5000 projects including over 400 major projects. These projects, successfully completed and operating smoothly (in most cases at more than rated capacity), have created an array of satisfied

clients. EIL has secured many repeat businesses from clients; a sign of client satisfaction, confidence and trust reposed in EIL.

**Over the past five decades,
EIL has executed more than
5000 projects including over
400 major projects worth
USD 200 Billion in total cost.**

EIL has earned the reputation of being a veritable treasure of technical knowledge, skills and professional competence. We have worked with almost all process licensors and a large number of engineering/ contracting companies worldwide and are well versed with international engineering codes and practices. With an workforce of over 3400 experienced employees determined to deliver projects, EIL offers an advantage to clients like none other.

**5.6 million available Technical Manhours annually
9,600 available Construction Management and Supervision Man-months annually**

GLOBAL PRESENCE

Geographical Regions	Key Countries served
Middle East	UAE Bahrain Kuwait Iran Oman Saudi Arabia Qatar Iraq
Asia Pacific	Australia Malaysia Indonesia Turkey Bangladesh Vietnam
Europe	Norway
Africa	Algeria Ghana Kenya Nigeria Angola Sudan Cameroon



TRACK RECORD

- 59 Refinery projects, including 10 green field refineries,
- 9 Petrochemical complexes,
- 39 Oil and Gas Processing projects,
- 209 Offshore platforms including 40 process platforms,
- 42 Pipeline projects,
- 13 Ports, Storage & Terminals,
- 8 Fertilizer projects,
- 29 Mining and Metallurgy projects,
- 29 Infrastructure projects (airports, highways, bridges, water management, & energy-efficient intelligent buildings),
- 17 Turnkey/EPC projects.

KEY STRENGTHS



TECHNOLOGY

- Technology Neutral Company - having experience with almost all Licensors.
- Dedicated R&D centre which has developed over 30 process technologies.
- In-house Specialist services in: Geotechnical, Material selection, Corrosion and Maintenance, Refractory engineering, Environmental engineering, Energy efficiency studies, Risk analysis, EIA, HAZOP and Safety services.
- Exposure to recent technological developments via practical implementation on projects.
- Continuous Process improvement through feedback from operating plants.

LEADERSHIP POSITION IN DESIGN, ENGINEERING AND PROJECT MANAGEMENT

- All capabilities under one umbrella offering services from Concept to Commissioning/Closure.
- Established Process Design Capabilities.
- Global presence and experience in project execution in challenging terrain, delivering Cost effective, Time bound, Quality solutions.
- Dedicated Planning, Estimation & Costing Departments.
- Extensive Revamp and Modernization experience.
- Five decades of Integrated engineering & project management experience in heavy industries.

VALUE ENGINEERING THROUGH INNOVATIVE SOLUTIONS

- Sourcing from its strong Basic Design Capabilities.
- Exposure to alternative technologies.
- Experienced and qualified technical personnel.
- Extensive in-house databank for complete projects in Process Design, Engineering, Costing and Procurement.
- Extensive Vendor capabilities Database with over 2000 vendors globally. Annual worldwide Equipment Procurement of over USD 2 to 3 Billion.
- In-house Construction Management Team for Quality Assurance and Construction Supervision.
- In-house bulk material control systems for management of bulk materials from Engineering to Construction stages.
- Continuous updation of Design Procedures based on feedback from clients and post-commissioning services.

QUALITY & HSE

- An ISO 9001-2008 certified company.
- Follows its in-house Quality and HSE procedures, manuals and lessons learnt during all stages of project execution from Conceptualization to Commissioning.
- Adheres to International and Local Environmental regulations and norms during implementation of all its projects.
- Received several Safety awards and Certifications from various clients and safety accreditation councils.



SERVICES FROM CONCEPT TO COMMISSIONING

PRE-PROJECT SERVICES

- Feasibility Studies (Pre, Detailed and Bankable)
- Financial Evaluation including sensitivity analysis
- Environment Impact Assessment for Mines and Process Plants
- Due diligence Studies
- Site Selection
- Technology & Process Licensor Selection
- Process Scheme Optimization
- Cost Estimation (Capital and Operating)
- Planning and Scheduling
- Mining Plans and Mine Closure Plans (for submission to Statutory Authorities)



SPECIALIST SERVICES

- Heat and Mass Transfer Equipment Design
- Environment Engineering
- Specialist Materials and Maintenance Consultancy
- Plant Operations & Safety including HAZOP, HAZID, SIL and Risk Analysis
- Corrosion Protection, Plant Integrity and Residual Life Assessment
- Yield & Energy Optimization Studies



PROJECT IMPLEMENTATION SERVICES

- Integrated Project Management
- Process Design and Front End Engineering
- Basic and Detailed Engineering
- Integrated 3D design & modeling
- Procurement
- Inspection and Third Party Certification
- Construction Management
- Commissioning and Plant Start-up Assistance
- Assistance during Factory Acceptance Tests
- Troubleshooting



MODES OF PROJECT IMPLEMENTATION - MINING & METALLURGICAL PROJECTS

- Scoping, Pre-Feasibility & Feasibility
- Preparation of Process, Design and Basic Design Engineering Package
- FEED Preparation
- Project Management Consultancy (PMC)
- Engineering, Procurement and Construction Management (EPCM)
- Flexible service bundle offering to suit client requirements & process complexity.

OUR ESTEEMED CLIENTS

- National Aluminium Company Ltd. (NALCO)
- Indian Aluminium Company Ltd. (Now Part of HIL)
- Hindalco Industries Ltd. (HIL)
- Sterlite Industries Ltd. (Now Vedanta Alumina Ltd.)
- Department of Ocean Development (DOD), Govt. of India (Ministry of Earth Sciences)
- Hindustan Zinc Ltd. (HZL), Vedanta Group
- Hindustan Copper Ltd. (HCL)
- Rajasthan State Mines & Minerals Ltd. (RSMML)
- SWIL Ltd./ Jhagadia Copper Ltd. (JCL)
- Gujarat Mineral Development Corporation Ltd. (GMDC)
- Bharat Aluminium Company Ltd. (BALCO), Vedanta Group
- Uranium Corporation India Limited (UCIL)
- Utkal Alumina International Ltd. (UAIL, Now Part of HIL)
- National Mineral Development Corporation Ltd. (NMDC)
- Defence Materials Research Laboratory (DMRL)
- Midhani
- VEDANTA Aluminium
- BHP Billiton, Australia
- Met Dist, U.K.
- Mawarid Mining LLC, Oman
- ALBA, Bahrain
- DUBAL, Dubai

Over 40 years of Design, Engineering & Project Management Expertise in Open Cast Mining & Non Ferrous Metallurgy for Metals and Industrial Minerals



AREAS OF OPERATIONS

GEOLOGICAL SERVICES AND RESOURCE ESTIMATION

- Review and analysis of available geological data/ reports.
- Laboratory and Pilot Plant Testing of Ores & Minerals (Through Third Parties).
- Estimation of geological and mineable resources/ reserves. Application of geostatistical methods for reliable determination of mineral resources.
- Ore body Modeling using specialized mining software.
- Planning, supervision and management of optimal exploration schemes for ore deposits.



MINE DESIGN

- Planning and Designing of Open Cast Mines to maximize ore recovery.
- Preparation of dynamic models of mining operations to determine fleet configurations, haul roads and optimum throughput.
- Use of latest software for mine designing.
- Estimation of inter-burden and over-burden waste volumes.
- Production programming: long range, medium range and short range for ore and waste.
- Quality control measures.
- Selection, sizing and determination of mining and auxiliary equipment based on mode of deposit occurrence, mining method chosen and techno-economic analysis of various alternative combinations.
- Infrastructure Facilities for Mines.
- Preparation of Mining Plan Document for submission to IBM in case of non coal mines.

MINERAL PROCESSING

Beneficiation/ Concentration of ores employing:

- Crushing & Screening
- Grinding & Classification
- Flotation
- Gravity Separation
- Magnetic & High tension Separation
- Thickening, Filtration, Drying & Product Storage

HYDRO METALLURGY

- Hot Leaching/Cold Leaching/Pressure Leaching/Bacterial Leaching/Heap Leaching for Zinc, Copper, Cobalt, Aluminium, Nickel, Gold etc.
- Pressure Digestion/Atmospheric Digestion for Bauxite, Concentrates, Converter Slag, Slimes.
- Precipitation and Purification for Alumina, Copper Sulphate, Nickel Sulphate.
- Solvent Extraction for Copper, Cobalt, Nickel etc.
- Pressure/Vacuum Filtration.
- Electro-winning for Copper, Zinc, Nickel, Cadmium, Gallium etc.
- Processing of Uranium oxide concentrate (yellow cake) to produce UO_2 pellets for Nuclear plants.
- Tar sands processing.

PYRO/ ELECTRO METALLURGY

- Smelting for Aluminium, Copper, Lead, Zinc, Silver, Cadmium, Titanium Sponge, Sponge Iron, Nickel, Cobalt, Gold, Gallium, Secondary Aluminium, Zeolite etc.
- Electro-winning & Refining for Copper, Lead, Zinc, Aluminium, Nickel, Cobalt, Cadmium, Silver.
- Wire rod rolling mill for Aluminium.
- Zirconium fuel fabrication processes for nuclear fuel.

Related Services Include:

- Electro Refining & Electro Winning tank-house
- Automated and semi-automated cathode handling systems
- Cellhouse
- Slimes handling and treatment



INFRASTRUCTURE FACILITIES

- Infrastructure facilities such as Roads, Water supply & distribution, Power supply & distribution, assess consumables etc.
- Assess the Environmental Impacts due to Mining and identify the critical site specific environmental aspects.

MATERIAL HANDLING AND LONG DISTANCE TRANSPORTATION

EIL provides study, planning, design and execution services for:

- Crushing Systems
- Bulk Material Handling by Earth Moving Equipment, Wagon Tippler, Feeders, Conveyors, Stacker, Reclaimer, Conveyors etc.
- Rail and Ship Loading and unloading
- Long Distance Transportation including Rope way, Conventional Conveyors, Pipe Conveyors, Single Flight Conveyors, Slurry Pipe links between Mine-Concentrator-Port along with downstream processing facilities.
- Dense Phase & Pneumatic Transportation
- Thickened Tailing Disposal (Red Mud/Ash/ Other Tailings)
- Stockpiles, silos and other storage facilities

THICKENED TAILINGS TECHNOLOGY

We plan and provide alternative solutions with thickened tailing disposals for metallurgical plants apart from co-disposal of tailings and waste rock.

ENVIRONMENTAL SOLUTIONS

We develop suitable Environmental protection measures depending on the deposit, mining method and the topography.

- Planning and execution during mine closure and reclamations.
- Preparation of EIA/EMP reports for submission to statutory authorities.
- Practical design solutions to improve gas and dust collection and treatment.

CONTINUOUS IMPROVEMENTS

EIL has up-to-date technical expertise to support improvements including mine/plant debottlenecking, capacity increases, and improvements in energy efficiency and water utilization. We provide Technical Due Diligence and Capacity Utilization of existing facilities and recommendation on new facilities.



OUR RANGE OF MINERALS & METALS

GEOLOGY MINING	BENEFICIATION	HYDRO METALLURGY	PYRO/ELECTRO METALLURGY
Bauxite	Lead-Zinc Ores	Alumina	Aluminium
Lead-Zinc Ores	Copper Ores	Zinc	Copper
Copper Ores	Rock Phosphate	Copper	Zinc
Rock Phosphate	Uranium Ore	Uranium	Lead
Uranium Ore	Ocean Nodules	Ocean Nodules	Sponge Iron
Lignite		Nickel	Titanium Sponge
Limestone		Cobalt	Nickel
Ocean Nodules		Nuclear Fuel	Ocean Nodules
			Nuclear Fuel Fabrication
			Manganese

SELECT PROJECTS

Commodity	Year	Project	Client	Scope of Services*
Aluminium	2013	Rectifier Replacement for lines 2 & 3 of Hirakud Aluminium Smelter	Hindalco Industries Ltd.	EP, PMC
Alumina	2013	4 th Stream Upgradation for Alumina Refinery	National Aluminium Co. Ltd.	FS, EPCM
Aluminium	2013	Additional Cast House Facilities for Mahan Aluminium Smelter Project	Hindalco Industries Ltd.	EP, PMC
Aluminium	2013	Aditya Aluminium Smelter Project	Hindalco Industries Ltd.	EP, PMC
Aluminium	2012	Cast House for Line-2 for Angul Aluminium Smelter	National Aluminium Co. Ltd.	EPCM
Aluminium	2012	Mahan Aluminium Smelter Project	Hindalco Industries Ltd.	EP, PMC
Bauxite, Alumina	2012	2 nd Phase Expansion of Bauxite Mines, Refinery and Aluminium Smelter	National Aluminium Co. Ltd.	FS, EPCM
Alumina, Aluminium	2011	Alumina Handling and Bath mixing for Angul Aluminium Smelter	National Aluminium Co. Ltd.	FS, EPCM
Bauxite	2011	Installation of Reclaimer and associated conveyors for Alumina Plant	National Aluminium Co. Ltd.	FS, EPCM
Aluminium	2011	Rectifier Replacement for Aluminium Smelter	Aluminium Bahrain	EP, PMC
Bauxite	2008	Expansion of Alumina Refinery at Muri	Hindalco Industries Ltd.	EPCM
Bauxite, Alumina	2006	1.4 Million TPA Alumina Refinery at Lanjigarh	Sterlite Industries (India) Ltd.	E, Insp
Aluminium	2003	Expansion of Hirakud Aluminium Smelter	Indian Aluminium Co. Ltd.	EPCM
Aluminium	2003	Expansion of Aluminium Smelter at Angul	National Aluminium Co. Ltd.	FS, EPCM
Lead-Zinc Ore	2002	Rampura - Agucha Mines and Beneficiation Plant Expansion Phase-II	Hindustan Zinc Ltd.	FS, EPCM
Bauxite, Alumina	2002	Expansion of Mines & Alumina Plant at Damanjodi	National Aluminium Co. Ltd.	FS, EPCM
Bauxite, Alumina	2000	Utkal Alumina Project	Utkal Alumina Intl. Ltd.	FS
Zeolite-A, SGA	1998	Zeolite & Special Grade Alumina Plant at Damanjodi	National Aluminium Co. Ltd.	FS, EPCM
Lead-Zinc Ore	1998	Expansion of Lead-Zinc Beneficiation Plant at Rampura-Agucha	Hindustan Zinc Ltd.	PD, EP, PM
Copper	1998	Copper Smelter & Refinery at Gujarat	SWIL Ltd.	EPCM
Limestone	1993	3,00,000 TPA SMS Grade Limestone Project at Sanu, Rajasthan	Rajasthan State Mines & Minerals Ltd.	FS, EPCM
Rock Phosphate	1991	Mining & Beneficiation Project at Jamarkotra, Rajasthan	Rajasthan State Mines & Minerals Ltd.	FS, EPCM
Lead- Zinc Ore	1991	Lead-Zinc Mining & Beneficiation Project at Rampura - Agucha, Rajasthan	Hindustan Zinc Ltd.	FS, EPCM
Copper	1990	Copper Refinery Modernisation at Ghatsila	Hindustan Copper Ltd.	EPCM
Mica Paper	1988	600 TPA Mica Paper & 300 TPA Insulating Products Project at Hazaribagh, Bihar	Mica Trading Corporation Ltd.	EPCM
Alumina, Aluminium	1987	Alumina & Aluminium Project in Odisha	National Aluminium Company Ltd.	EPCM
Lignite	1986	Lignite Mine Expansion in Gujarat	Gujarat Minerals Development Corporation Ltd.	EPCM
Zinc	1983	Modernisation of Purification System in Zinc Electolysis Plant at Vishakhapatnam	Hindustan Zinc Ltd.	FS, EPCM
Lead	1983	Lead Smelter Expansion at Vishakhapatnam	Hindustan Zinc Ltd.	PD, EPCM
Copper Ore	1982	Copper Concentrator at Malanjkhand	Hindustan Copper Ltd.	EPCM

Commodity	Year	Project	Client	Scope of Services*
Rock Phosphate	1982	Semi Industrial Rock Phosphate Beneficiation Plant at Jhamarkotra	Rajasthan State Mines & Minerals Ltd.	PD, EPCM
Silver	1980	Silver Refinery at Vishakhapatnam	Hindustan Zinc Ltd.	EPCM
Zinc	1980	Zinc Roaster Revamp at Debari, Rajasthan	Hindustan Zinc Ltd.	EPCM
Lead	1979	Lead Smelter at Vishakhapatnam	Hindustan Zinc Ltd.	EPCM
Zinc	1979	Zinc Smelter at Vishakhapatnam	Hindustan Zinc Ltd.	EPCM
Lead	1975	Lead Concentrator at Agrigundala	Hindustan Copper Ltd.	CA, PMC
Copper Ore	1973	Copper Concentrator at Dariba	Hindustan Copper Ltd.	CA, PMC

* Scope of Services

CA: Commissioning Assistance

E: Engineering

EP: Engineering and Procurement

EPCM: Engineering, Procurement, and Construction Management

FS: Feasibility Study/ Detailed Project Report

PD: Process Design

PMC: Project Management consultancy

Insp: Inspection

[Expertise across the entire mineral value chain]



SHOWCASE PROJECTS

Integrated Aluminium Project of M/s NALCO in Odisha

EIL has over 3 decades of association with NALCO, one of India's largest manufacturers of Alumina and Aluminium, for development of their Mining, Smelter and Refinery plants.

The multi-locational Integrated Greenfield project was completed in 1988 by EIL. Aluminium Pechiney of France, now Rio Tinto Alcan, provided the basic engineering for this AP18 technology plant.

EIL also executed 1st phase expansion completed in 2003 and 2nd phase expansion completed in 2012 for debottlenecking and upgradation of stream sizes as well as addition of streams, in both alumina plant and the smelter, with commensurate increase of bauxite production from the mine.

EIL executed these projects successfully despite difficult geographical location, hilly terrain, cyclones, heavy rainfall and dense forest cover.

Client : M/s National Aluminium Company (NALCO)

Services : Feasibility, Engineering, Procurement, Project Management, Construction Supervision & Management and Commissioning assistance.

Facility and Location	Phase	Capacity (In Million TPA of Ore/Alumina/Aluminium)	Key features
Bauxite Mine	Greenfield	2.4	<ul style="list-style-type: none"> Located at a height of 1300 m above mean sea level. Deployment of High capacity Ripper doser for substituting blasting Introduction of Novel Trench Mining and Mine-reclamation methods
	1 st Expansion	Increased from 2.4 to 4.8	
	2 nd Expansion	Increased from 4.8 to 6.3	
	4 th Stream Upgradation	Increased from 6.3 to 6.825	
Alumina Refinery at Damanjodi	Greenfield	0.8	<ul style="list-style-type: none"> Linked to the bauxite mine with a first of its kind 14.6 km long contour hugging cable belt conveyor. Thickened tailings disposal and deep cone washing Caustic Effluent Disposal & Red Mud disposal system leading to Zero Effluent discharge. Centralized compressed air system designed to cater the requirement of compressed air for better logistics, cost benefit & low maintenance. Introduction of state-of-the-art technology HRD/DCW, Diaster Filter, Vibrating Grinder thereby reducing the losses. Engineering & design of Tanks up to the capacity of 4500 m³ and 35 m in height. Managed over 150 vendors for procurement and over 40 contractors at site including package contractors.
	1 st Expansion	Increased from 0.8 to 1.575	
	2 nd Expansion	Increased from 1.575 to 2.1 with addition of 4 th stream	
	4 th Stream Upgradation	4 th steam increased from 0.525 to 0.7 (overall capacity increased from 2.1 to 2.275)	
Aluminium Smelter at Angul	Greenfield	0.218	<ul style="list-style-type: none"> Linked to the alumina refinery through 450 km rail line. Zero Effluent discharge HDPS for continuous feeding of alumina to the pots & Pot Regulation System (Alpsys). Integration of cathode sealing area by procuring induction furnace, heating system and shot blasting machines separately, thereby reducing cost. Managed over 120 vendors for procurement and over 20 contractors at site including package contractors.
	1 st Expansion	Increased from 0.218 to 0.345	
	2 nd Expansion	Increased from 0.345 to 0.46	

Time-bound quality results in challenging geography & tropical climate



360,000 TPA Mahan Aluminium Smelter Project

Client Hindalco Industries

Scope Basic Design, FEED, Engineering, Procurement and Project Management

Location Bargawan, Singrauli, Madhya Pradesh, India

Project features

The Mahan Aluminium Smelter uses globally proven AP 36 technology of Rio Tinto Alcan with enhanced power efficiency and improved manpower productivity. This state of the art facility has already started production and is ramping up as per the schedule.

The project facilities included Main Receiving & Conversion Substation (220KV), 360kA Pot Line with 360 pots, Gas Treatment Centre, Pot Room Annexe, Green Anode Plant (GAP) including Anode Paste Plant & Anode Cooling, Anode Handling System, Anode Baking Furnace (ABF), Anode Rodding Shop, Bath & Butt Processing & Storage, Cast House, Fume Treatment Centre (for ABF), Raw Materials Handling Facility (for Alumina, CP Coke, Solid/Liquid Pitch, Aluminium Fluoride), Utilities & Offsites, and Infrastructure Facilities including Effluent Treatment Plant. The CPP constitutes six units of 150 MW each, with one of them acting as a stand by unit.



360,000 TPA Aditya Aluminium Smelter Project

Client Hindalco Industries

Scope Basic Design, FEED, Engineering, Procurement and Project Management

Location Lapanga, Sambalpur, Odisha, India

Project features

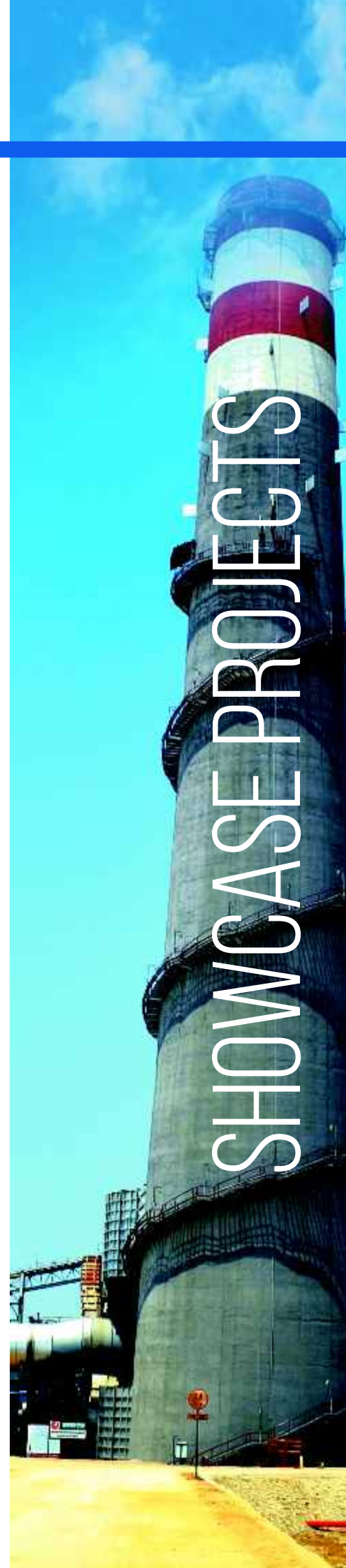
The project boasts a 360,000 tonnes smelter supported by a 6 x 150 MW coal based captive power. It employs AP 36 technology supplied by Rio Tinto Alcan.

The project facilities included Main Receiving & Conversion Substation (220KV), 360kA Pot Line with 360 pots, Gas Treatment Centre, Pot Room Annexe, Green Anode Plant (GAP) including Anode Paste Plant & Anode Cooling, Anode Handling System, Anode Baking Furnace (ABF), Anode Rodding Shop, Bath & Butt Processing & Storage, Cast House, Fume Treatment Centre (for ABF), Raw Materials Handling Facility (for Alumina, CP Coke, Solid/Liquid Pitch, Aluminium Fluoride), Utilities & Offsites, and Infrastructure Facilities including Effluent Treatment Plant.

The plant includes additional facility for production of baked anodes for Hindalco's another smelter at Hirakud, Odisha (EIL also provided Engineering, PMC, and Commissioning services for Hirakud smelter). Alumina is sourced from Utkal Alumina, a 100% subsidiary of Hindalco (EIL also conducted pre-project activities, DFR, EIA and Risk studies for Utkal Alumina Project).

The smelter project has been designed to achieve world benchmark cost structure and enhances Hindalco's cost competitiveness significantly, making it one of the most efficient primary aluminium companies globally.

SHOWCASE PROJECTS



50,000 TPA Copper Smelter & Refinery Project

Client M/s SWIL Ltd.

Scope Engineering, Procurement, Project Management and Commissioning

Location Jhagadia, Bharuch, Gujarat, India

Project features

This Greenfield Secondary Copper Smelter and Refinery Project produces 50,000 MTPA Copper cathodes, conforming to LME Grade 'A' and 20,000 MTPA per annum of copper anodes. This plant is set up in collaboration with Boliden, Sweden. The plant uses Top Blown Rotary Converter (Kaldo) as its main furnace and is one of the very few operations in the world where copper is successfully made through the Kaldo process. The Kaldo furnace is a top blown, oil-fired rotating converter and is used for smelting and refining of a wide variety of copper-bearing raw materials.

Besides the Kaldo furnace, project facilities also included installation of units such as, Converter (Pier-Smith), Anode Furnace, Anode Casting Wheel, Electrolysis Plant, Rectifiers and Transformers, Driers, Slag Granulation Unit, Venturi Scrubber, Water Treatment & Filtration, Lime Scrubber, Oxygen Plant, Compressors, LPG Storage, Effluent Treatment Plant. etc.



4,500 TPD Lead-Zinc Mining & Beneficiation Project (Greenfield and Expansion)

Client M/s Hindustan Zinc Ltd (now a Vedanta Group company)
One of the world's largest integrated zinc lead producers by volume.

Scope Cost Estimate Report, Mining Plan, Engineering, Procurement, Project Management, Construction Supervision and Commissioning Assistance.

Location Rampur Agucha, Bhilwara, Rajasthan, India

Project features

EIL was engaged as the prime consultant for this 3000 TPD Mining & Beneficiation project comprising an open pit mine and a beneficiation plant including tailing dam.

The beneficiation plant included Primary, Secondary & Tertiary Crusher Houses, Main Process Plant, Concentrate Storage, Tailings Pipeline and Tailings Dams. The unit operations within main process plant were Grinding (Rod mill - Ball mill combination), Classification, Column Floatation, Thickening, Filtration by Automatic Pressure Filter, Reagent Preparation etc.

This plant was further expanded to process 4500 TPD of Pb-Zn ore.

SHOWCASE PROJECTS

850,000 TPA Phosphate Mining & Beneficiation Project

Client M/s Rajasthan State Mines and Minerals Ltd. (RSMML)

Scope Study, Process Engineering, Hydro-geological studies, Blasting optimization studies, Engineering EPC tendering, EIA, EMP, Procurement, Project Management, Construction Supervision, and Commissioning Assistance

Location Jhamarkotra, Udaipur, Rajasthan, India

Project features

Based on the pilot studies and subsequent DPR prepared by EIL, M/s RSMML engaged EIL to provide consultancy services for implementing this project in industrial mineral sector.

Rock Phosphate is mined by open pit method to produce HGO and LGO along with waste.

- 12 Million TPA Open Pit Mine
- 0.4 Million TPA Crushing Plant (HGO)
- 0.45 Million TPA Beneficiation Plant (LGO)
- Dam on River Jhamri
- Raw Water Pipeline (10 km long)

The pockety stromatolitic phosphate deposit has a length of 16 km and the opencast mine was designed in two pits to include seven of the 11 blocks. High Grade Ore (HGO) is crushed and sold, as such. Low Grade Ore (LGO) is crushed, ground and subjected to two-stage flotation for silica & magnesia rejection. The resultant concentrate is thickened and filtered.

EIL has recently carried out updation of mining scheme for the mine based on further explorations carried out by RSMML.



10, 000 TPA Zeolite-A project

Client M/s National Aluminium Company (NALCO)

Scope Study, Process Engineering, Engineering, Procurement, Project Management, Construction Supervision and Commissioning Assistance

Location Alumina Refinery, Damanjodi, Odisha, India

Project features

Zeolites are traditionally defined as crystalline aluminosilicates. Zeolites have unique water softening properties and are used as a substitute to sodium-tri-poly-phosphate (STPP) for manufacturing of detergent. The project was located in Alumina Refinery of NALCO at Damanjodi in Odisha. The technology for making Zeolite-A from process liquor of Alumina Refinery was developed on laboratory scale by Central Salt & Marine Chemicals Research Institute (CSMCRI), Bhavnagar. EIL has carried out the industrial scale up of the technology. Basic process steps involve Chemical Reactors, Filtration and Drying using Spray Drier.

20,000 TPA Special Grade Alumina Project

Client M/s National Aluminium Company (NALCO)

Scope Study, Process Engineering, Engineering Procurement, Project Management, Construction Supervision, and Commissioning Assistance

Location Alumina Refinery, Damanjodi, Odisha, India

Project features

Special Grade Alumina (SGA) is a value added product obtained by processing reduction grade alumina. SGA is used in manufacturing of refractory bricks, ceramics, insulators etc.

Technology for this project was supplied by Alumina Technology Associates, USA. EIL has carried out industrial scale-up of the plant to 20,000 TPA capacity.

Basic steps in manufacturing process involve fluid bed as well as flash drying, pressure filtrate, various size reduction equipment such as Air Jet Mill, Ceramic Ball Mills and Air Classifying Mills, Recalcination (hard burning) of calcined alumina in Tunnel and Bell Kilns, Dense phase Pneumatic Conveying Systems etc.



2,000,000 TPA Malanjkhand Copper Mining and Beneficiation Project

Client M/s Hindustan Copper Limited

Scope Deposit evaluation, Mine Planning, Front End Engineering, Detailed Engineering, Procurement, Project Management, Construction Supervision, and Commissioning Assistance

Location Balaghat, Madhya Pradesh, India

Project features

Malanjkhand is located deep in the jungles of Madhya Pradesh and very close to Kanha National Park. Without any rail connection close by, all material movements for the project had to be carried out by road.

Plant facilities that were covered in EIL's scope included ROM Storage, Crushing & Screening Plant, Beneficiation Plant including Grinding, Flotation and Dewatering, Tailings Disposal and Water Recovery System, Electrical receiving and Distribution System for Mine and Concentrator, Water Distribution System as well as Maintenance Facilities for open pit mine and concentrator.



450,000 TPA INDAL Alumina Refinery Expansion Project

Client M/s Indian Aluminium Company Limited (INDAL)

Scope Residual Basic Engineering, Process Engineering, Detailed Engineering, Procurement, Project Management, Construction Supervision, and Commissioning Assistance

Location Muri, Jharkhand, India

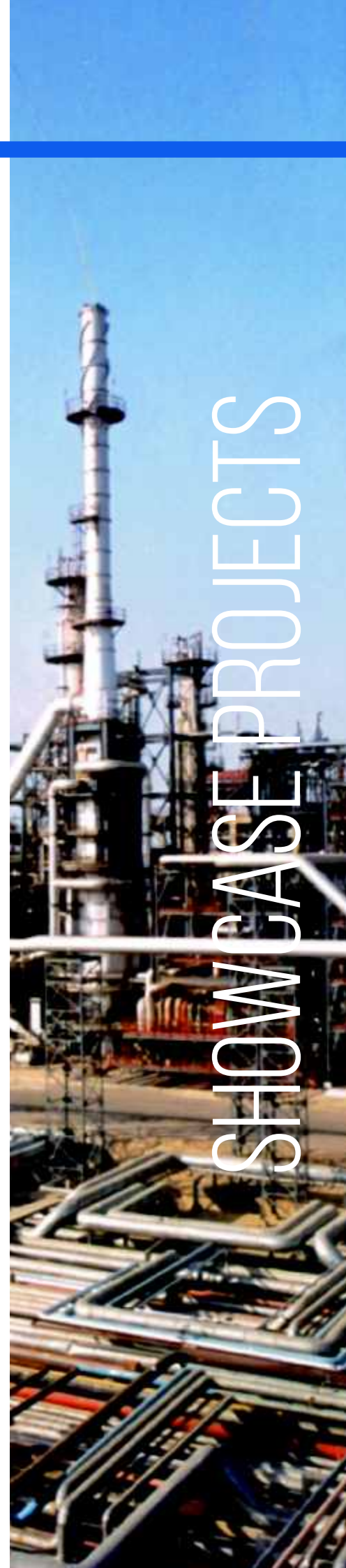
Project features

The project involved expansion of Alumina Refinery from 0.11 MMTPA to 0.45 MMTPA Capacity. The project facilities include all process units starting from receipt of bauxite inside Alumina Plant boundary till Alumina loading into wagons, Co-generation Plant with coal handling, ash disposal & associated utilities, Additions/ modifications in following units:

- Power Distribution within the plant
- Unloading, Storage, handling & distribution networks for Bauxite Caustic Soda lye, Coal & Fuel Oil for the plant
- Raw Water supply, treatment, storage & pumping
- Distribution network for treated water, compressed air and steam for the plant
- Causticisation
- Yard Piping
- Cooling towers & Cooling water distribution network within the plant
- Disposal of red mud slurry to mud stacking area, reclamation and recycling of water to Alumina Plant based on existing system
- Environmental Pollution Control System
- Loading facilities for dispatch of Alumina/ Hydrate
- Utilities & Offsites



SHOWCASE PROJECTS



Corporate Office

Engineers India Bhawan
1, Bhikaiji Cama Place, R K Puram
New Delhi-110 066
Tel. : +91-11-26762121
Fax : +91-11- 26178210, 26194715
E-mail : eil.mktg@eil.co.in

Mining & Metallurgy Division

R&D Complex, Sector-16 (on NH-8)
Gurgaon, Haryana-122001
Tel. : +91-124-3803602
Fax : +91-124-3802901
E-mail : eil.mktg@eil.co.in

Branch Office

Great Eastern Chambers
5th Floor, Plot no. 28, Sector-11
Belapur C.B.D., Navi Mumbai – 400 614
Tel. : +91-22-27599301, 27563069
Fax : +91-22-27572011, 27563094
E-mail : eil.bo@eil.co.in

Regional Offices

A.G. Towers (5th Floor), 125/1, Park Street
Kolkata – 700 017
Tel. : +91-33-22298995, 22276304
Fax : +91-33-22278902
E-mail : eil.rok@eil.co.in

4th & 5th Floor, Meghdhanush Complex
Race Course Road
Near Transpek Circle, Vadodara – 390 015
Tel. : +91-265-2340326, 2340368
Fax : +91-265-2340328
E-mail : eil.rov@eil.co.in

Plot No. F-9, SIPCOT IT Park, Siruseri
Chennai - 603 103
Tel. : +91-44-27469401-9402
E-mail : eil.roc@eil.co.in

Overseas Offices

Flat No. 1703, 17th Floor, Al-Salam Street
Abdullah Bin Darwish Building, Abu Dhabi
United Arab Emirates (U.A.E)
P. O. Box 126592
Tel. : +9712-6740101
Fax : +9712-6740707
E-mail : cooilad@eiluae.ae

EIL Asia Pacific Sdn.Bhd. Suite B-02-05
Dataran 3 Two, No. 2, 19/1
46300 Petaling Jaya, Selangor Darul Ehsan
Kuala Lumpur, Malaysia
Tel. : +603-77255279
Fax : +603-77261027

Engineers India Limited

Design | Engineering | Technology | Project Management | EPC

www.engineersindia.com



Refineries



Petrochemicals



Offshore



Pipelines



Metallurgy