

EDUCATION:

- **B. E.(Honors) Chemical Engg**, Birla Institute of Technology & Sciences (BITS), Pilani, India, **1986**.
- **M.S. Consultancy Management**, Birla Institute of Technology & Sciences (BITS), Pilani, India, **2008**

PROFESSIONAL CERTIFICATIONS:

*Certified Project Management Professional PMP®
Certified Professional Engineer*

SUMMARY OF PROFESSIONAL EXPERIENCE:

*Over **thirty years** of “**Concept to Commissioning**” experience including leadership roles in Project Management, Engineering Management, Project Integration, Interface management, Vendor management, Procurement management, Process Engineering, Pre-commissioning / Commissioning and Start-Up.*

My project experience includes joint ventures, workshare, multi-office / multi-location (Australia, China, India, Saudi Arabia, US, Canada) project execution with multi-national teams for successful execution of several multi-billion dollar green field as well as brown field projects in India as well as internationally for Mining & Metals, Chemicals, Oil & Gas, and Power industries.

I have extensive and successful experience of working with international client as well as EPCM / PMC consultancy companies such as Rio Tinto Alcan, Fluor, Bechtel, Worley Parsons, Hatch, EIL, SNC Lavalin etc..

My experience is also varied with regard to commercial structure as I have worked on Lump Sum as well as Cost Reimbursable projects.

Successfully executed several large international (multi-billion dollar) projects involving

- *development of execution strategy & planning;*
- *project integration and interface management*
- *technology evaluation & selection;*
- *site selection;*
- *conceptual & detailed feasibility studies;*
- *development of scope of work, responsibility matrix & battery limits;*
- *process engineering including hazard studies like HAZOP, HAZID, JHA, PSSR;*
- *detailed engineering including 3D model review;*
- *development of plot plan, plant layout;*
- *budget & schedule development;*
- *change management;*
- *pre-commissioning/commissioning & start-up and operation*

*Adherence to high standards of Health, Safety and Environmental norms in all aspects of working.
Managed millions of safe working hours for various projects.*

KEY STRENGTHS:

- *Deep knowledge of Alumina refining and Aluminium smelting process including latest developments in the technologies such as, double digestion, HOT's high pressure tube digestion, high pressure red mud filtration, high amperage pot cells, hyper dense phase pot feeding system, PTMs etc.*
- *Significant experience in scale-up and design of commercial plants based on technologies developed by Indian & foreign research laboratories for first time implementation such as Zeolite, Gallium, poly metallic nodule extraction, special grade alumina etc..*
- *Strong leader with strategic thinking - development of project execution strategy for implementation of project with optimal capital and operating costs, optimal project schedule with a view to achieve maximum returns to the stake holders*
- *Good analytical skills for diagnosis of root cause and innovative solutions*
- *Management of relationships with EPCM/clients, process licensors and vendors/contractors to achieve project objectives*
- *Cost and time consciousness (Time is money)*

- Safety and Quality consciousness
- Awareness of various engineering disciplines work procedures
- Awareness of international codes, standards and practices

MAJOR PROJECT EXPERIENCE:

SUMMARY OF EXPERIENCE

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|---------------------------------|--------------------------------|
| • January 2014 onwards | Archimedes Engineers Pvt. Ltd. |
| • October 2015 – September 2016 | Fluor India |
| • February 2012 – December 2013 | Rio Tinto Alcan, Canada |
| • July 2008 – February 2012 | Fluor Australia, Saudi Arabia |
| • February 1993 – June 2008 | Engineers India Ltd. |
| • January 1987 – January 1993 | Hindalco Renukoot |

**A. Archimedes Engineers Pvt. Ltd. (India) as Principal Consultant and Chief Executive Officer
(January 2014 – September 2015, October 2016 onwards)**

1. **Project Manager for Piping Design for complete package and Civil & Structural Design of Piperacks for Nalco's Stream #1, 2 & 3 Settlers & Washers Retrofit Project in their Alumina Refinery at Damanjodi for M/s Furnace Fabrica (October 2019 onwards).**
2. **Subject Matter Specialist (SME) for M/s RBSA for Technical Due Diligence of ANRAK's 1.5 million tpa Alumina Refinery at Vishakhapatnam for one of their client (March -June 2019).**
3. **Process Specialist and Project Manager for Design & Engineering support to M/s FLSmidth for installation of Flocculant Dosing System at UAIL's Alumina Refinery at Doragurha for their 0.5 million tpa expansion (February 2019 onwards).**
4. **Subject Matter Specialist (SME) for M/s KPMG in Project Management Offices established for 0.5 million tpa expansion of Utkal Alumina International's Alumina Refinery at Doragurha and 1.0 million tpa expansion of NALCO's Alumina Refinery at Damanjodi (November 2018 onwards).**
5. **Project Manager for Feasibility Study of Sulfur Handling Facility for M/s IHS Markit, Dubai for their confidential Client located in GCC country (February - March 2019).**
6. **Sr. Alumina Specialist for Detailed Engineering assistance to GCACPL for execution of their 60,000 TPA Alumina Hydrate Plant at Mundra based on Kutch Bauxite on behalf of Aluminpro, Canada (March 2017 – March 2019).**
7. **Project Manager & Sr. Alumina Specialist for performance evaluation of Evaporation Trains installed at Vedanta Aluminium's Alumina Refinery at Lanjigarh with a view to enhance its capacity. We are able to enhance Evaporation capacity by ~25% with minor investment. (December 2017 – March 2018).**
8. **Project Manager & Sr. Alumina Specialist for review of all major pumping systems installed at Hindalco's Alumina Refinery at Belgaum with a view to improve its process efficacy and energy efficiency. (December 2017 – March 2019).**
9. **Project Manager for detailed design of tanks & vessels for M/s GCACPL's 60,000 TPA Alumina Hydrate Plant at Mundra. (September 2017 – August 2018)**
10. **Project Manager for Rehabilitation & Stabilization of Seed Filter Building at Hindalco Renukoot which has been raised by upto ~900mm on one end due to bloating of soil under foundations as a result of reactions with Caustic Soda. (March – October 2018).**
11. **Project Manager for development of a Devolution of Authority matrix for procurement of delayed or missed out or previously unidentified equipment, materials and services in all Aditya Birla Group projects specially during the end phase of the Project for Aditya Birla Management Corporation Pvt. Ltd. (ABMCPL). (December 2017 – March 2018).**
12. **Alumina Specialist for Feasibility Study for installation of Red Mud Filtration Unit at NALCO's 2.275 million tpa capacity Alumina Refinery at Damanjodi. The study involved pilot scale test work at site with actual DCW underflow.(April - July 2017)**

13. **Sr. Alumina Specialist for Technical Due-Diligence of ANRAK Alumina Refinery at Vishakhapatnam (Andhra Pradesh) to ascertain its completeness, readiness for start-up and financial support requirement including its capability to upgrade / expand in short & medium term for M/s iLabs Group (Hyderabad) on behalf of a group of investors. (February – April 2017).**
14. **Sr. Process Specialist for Technical Review of Digestion and associated units to ascertain its turndown capability and improve process / energy efficiency for Belgaum Alumina Refinery of M/s Hindalco Industries Ltd. (March - April 2017).**
15. **Sr. Alumina Process Specialist & Project Manager for Design & Engineering for resolutions / modifications in Digestion Emergency Pressure Relief system of Utkal Alumina International Ltd (UAIL), India to mitigate risk to plant personnel, property and environment. (June 2014 – September 2015).**
16. **Developed Standard Procedure for Pre-commissioning, Commissioning and Start-Up for all Aditya Birla Group projects for Aditya Birla Management Corp. Ltd. (November 2014 – March 2015).**
- B. FLUOR (India, Australia & Saudi Arabia) as Technical Director / Project Manager (July 2008 – February 2012, October 2015 – September 2016)**
 17. **Senior Project Engineer (Grass Root) managing Process, Mechanical, Modularization and Procurement scope for execution of Rotterdam Advanced Hydrocracker Project (a brown field expansion) of M/s ExxonMobil's Rotterdam refinery to produce high quality lubricating oils and greases using their own proprietary catalysts applied in their refinery process. (December 2015 – September 2016).**
 18. **Project Manager for execution of Adhesive Capacity Expansion Project (US\$100 million) of M/s Cytec, USA for their project in Wrexham, Wales, UK (October 2015 – September 2016)**
 19. **Process Manager, Engineering Coordinator, Interface Manager & Pre-Commissioning Manager in different stages of the project for 1.8 million tpa capacity Greenfield Alumina Refinery (US\$ 3 billion) at Ras Al Khair in Saudi Arabia for M/s Saudi Arabian Mining Company (Ma'Aden) (July 2008 – January 2009, October 2010 – February 2012); responsible for process engineering, engineering coordination among various engineering offices such as WPF (Worley Parsons Fluor JV), Brisbane, Fluor Greenville (USA) office, Hatch, Brisbane & India and Fluor-Al Khobar (Saudi Arabia), with client and pre-commissioning activities.**
 20. **Process & Engineering Manager for Techno-Economic Feasibility Study of 1.5 / 3.0 million tpa capacity Greenfield Mine and Alumina Refinery (US\$ 2.2 billion) at Cameroon for M/s Cameroon Alumina Limited (February – December 2009); responsible for all process and engineering activities. Project included site selection, development of plot plan, plant layout, equipment list, etc for the bauxite mines and alumina refinery along with coal based captive co-generation plant for steam and power supply, rail/road/ship transport logistics & storage facilities for raw materials supply and product evacuation to/from remote site in Cameroon along with other support facilities.**
- C. RIO TINTO ALCAN (India & Canada) as Engineering Manager / Project Manager (February 2012 – December 2013)**
 21. **Dy. Engineering Manager and Project Manager for Kitimat Modernisation Project (US\$ 4 billion Aluminium Smelter Project in Canada). Project involved demolition of existing facility and construction of a new 420 ktpa smelter with support facilities. As Owners' representative in Bechtel's New Delhi office, was responsible for engineering management, project controls, procurement management and project management in Bechtel's New Delhi office which accounted for 70% of detailed engineering & procurement work and had 220+ team at the peak. Also managed procurement as Project Procurement Manager based in Montreal and Kitimat (Canada) in second half of 2013.**
- D. ENGINEERS INDIA LIMITED, India last as Senior Manager (Process) (February 1993 - June 2008)**
 22. **Group Leader (Process) for EPCM of Brownfield revamp and expansion of Alumina Refinery (US\$300 million) from 110ktpa to 450 ktpa at Muri, Jharkhand for M/s Hindalco, India based on Alcan's double digestion technology (March 2004 – May, 2008); responsible for process engineering activities including process design and basic**

engineering based on conceptual design provided by Alcan for units other than digestion, settling & washing and precipitation units. Project included coal based co-generation plant for steam and power supply in addition to alumina refinery along with support facilities for raw materials supply and product evacuation to/from site.

23. **Project Manager for Detailed Project Report** on 4th Stream Capacity Upgrade from 0.525 to 0.700 million tpa in **Alumina Refinery (US\$150 million)** at Damanjodi, Orissa for **M/s National Aluminium Company Limited (NALCO)**, India based on **Alcan (AP) technology (June – December, 2007)**; responsible for all project management, engineering and cost estimation activities.
24. **Lead Process Engineer for Expansion of Mine and Alumina Refinery (US\$400 million)** by 0.525 million tpa at Damanjodi, Orissa for **M/s NALCO** based on **Alcan (AP) technology (March 2007 – June 2008)**; responsible for process engineering activities. Project also included expansion of steam & power plant and other support facilities.
25. **Project Manager for Techno-Economic Feasibility Study** for installation of **7 tpa 4N+ Purity Gallium Plant (US\$25 million)** at Damanjodi, Orissa for **M/s NALCO** based on solvent extraction technology developed by **Nippon Light Metals, Japan (October 2007 – May 2008)**; responsible for project management, process design, engineering and cost estimation activities.
26. **Lead Process Engineer for EPCM** of 1.4 million tpa **Greenfield Mine & Alumina Refinery (US\$800 million)** at Lanjigarh, Orissa for **M/s Vedanta, India** based on **Worley Parsons technology (November 2003 – March 2005)**; responsible for Process Engineering of red side units. Also deeply involved in development of steam & power plant package for coal based co-generation plant.
27. **Lead Project Engineer** for detailed feasibility study for **2nd phase expansion of NALCO's coal based Power Plant at Angul from 960 to 1200 MW**. Project included assessment of alternatives for boiler & turbine sizes, schemes for MVAR improvement, development of merry-go-round rail network for supply of coal from nearby Mahanadi Coalfield and introduction of high density ash slurry transport to ash pond (**February – November 2002**).
28. **Group Leader (Process) for Scale-up & Design, detailed feasibility study and execution** of 10,000 tpa **Zeolite – A Project (US\$10 million)** at Damanjodi, Orissa for **M/s NALCO** based on Central Salt and Marine Chemicals Research Institute (CSMCRI), India technology (**April 1994 - January 1995, July 1998 – December 2001**); responsible for scale-up, process design and engineering activities.
29. Contracted to **SNC-Lavalin, Canada** as **Process Specialist for Detailed Feasibility Study (±15% cost estimate)** for **Debottlenecking & Expansion of the Kirkvine Alumina plant and addition of a high-pressure Double Digestion unit at the Ewarton Alumina plant of ALCAN JAMAICA (February, 1996 – July, 1996)**; responsible for all process engineering activities.
30. **Project Manager for Feasibility Study and Rapid Environmental Impact Assessment Report** for the 3.0 million tpa **Mine & Alumina Refinery Project (US\$1.4 billion)** of **Utkal Alumina International Limited (November 2000 to July 2001)**; responsible for project management, process design, engineering and cost estimation activities.
31. **Group Leader (Process) for EPCM** of Greenfield 50,000 tpa **LME Grade – A Copper Refinery (US\$200 million)** at Bharuch, Gujarat for **M/s SWIL Limited, India** based on **Boliden Contech, Sweden technology (August 1996 – July 1998)**; responsible for process engineering activities. Project included copper smelter, gas cleaning scrubbers, copper refinery and nickel sulphate plant along with waste heat boilers for supply of steam along with support facilities.
32. **Group Leader (Process) for EPCM of Pilot plant (US\$12 million)** for processing sea-bed nodules (bearing Nickel, Cobalt, Copper) for extraction of metals at **Hindustan Zinc Limited, India** based on technology developed by Department of Ocean Development, Government of India (**1996 – 1998**).

E. HINDALCO INDUSTRIES LIMITED, India last as General Foreman / Senior Engineer (January 1987 – January 1993)

33. *From December 1989 to January 1993, worked in the **Energy & Development Cell of Alumina Refinery**. Job responsibility included Energy and Technical Audits of Alumina Plant, troubleshooting, investigation, evaluation and optimization of process plant performance, conceptualization and development of technological upgrade and expansion projects.*
34. *From January 1987 to December 1989, worked as **Shift Engineer (Plant Operation & Process Control) in Alumina Refinery** based on Kaiser's high temperature digestion technology. Responsible for smooth operation of plant, process control & trouble shooting, achievement of production targets and management of manpower.*