IDK HIRALAL

Bauxite & Alumina Process Technology Consultant

Summary

Years of Experience

40+

Industries

- Bauxite
- Alumina

Types of Facilities

- Alumina Refineries
- Bayer Process plants

Areas of Expertise

- Concept and Feasibility Studies
- State-of-the art Alumina Refinery Process Design
- Techno-Economic Analysis of Greenfield and Brownfield Alumina Projects
- Operational Cost and Capital Cost Review of Greenfield Refinery
- Alumina Refinery Technology Reviews including Best Available Technology
- Operational Performance Review and Process Engineering Support to meet Benchmark level
- Laboratory Assessment of Processing Characteristics of Bauxite
- Due Diligence Reviews
- Knowledge of China and Western World Alumina Refinery Technology

Professional Summary

With more than 40 years' experience in the International Bauxite & Alumina industry, extensive knowledge and insights have been obtained in the details of technological and design aspects practiced in the Bayer process as developed by the mayor alumina producers ALCOA, ALCAN, REYNOLDS, KAISER ALUMINA, ALUISUISSE, BHPBILLITON, PECHINEY, etc. as well as practiced in CHINA. Employment history include various technical and managerial roles in operations, research, central office with Alcoa and BHP-Billiton and since 2004, self-employed, providing consultancy services to the international alumina industry.

Qualifications

Education

Academic, Ir. (MSc) degree in Mineral Processing and Extractive Metallurgy from the University of Technology, Delft, The Netherlands (1980)

Publications / Presentations

- Author and co-author of various publications on alumina refinery operations and technology
- Presentations made at the TMS in the USA and Alumina Quality Workshops in Australia
- Holder of a patent on the improvement of the Precipitation Process in Alumina Refineries

Languages

- English
- Dutch

Experience

Paranam Refinery Operations – Owners: Alcoa & BHPBilliton, location Suriname

In the subsequent roles of process engineer to head of technical department, responsible for improvement in process efficiency, production capacity and product quality

Alumar Refinery Operations - Owners: Alcoa, BHPBilliton & Alcan, Location Sao Louis, Brazil

Owner Technical representative. Review of capital and technological improvement projects

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Experience

Alumar Refinery Precipitation Performance Improvement – Sao Louis, Brazil

- Model Simulation of the Precipitation Circuit to identify and implement improvement options.
- Training of Alumar Process engineers in the use of the precipitation simulation model
- Review of feasibility study, design and implementation of the expansion of the refinery

Aughinish Alumina Refinery Performance Review – Alcan/BHPBilliton, Askeaton, Ireland

Owner Technical representative. Review and advise on capital and technological improvement projects

Worsley Alumina Refinery Performance Review – Reynolds Metals/BHPBilliton

Owner Technical representative. Review and advise on capital and technological improvement projects

Worsley Alumina Refinery Expansion-BHPBilliton, Colli, Western Australia

- Involved in the Expansion study including process design and modeling
- Involved in the Expansion study including process design and modeling of a new alternative Precipitation circuit
- Performed Field trial of Hydro Cyclones of different suppliers to select the best for the classification of hydrate product and seed

Yarwun Alumina Refinery Expansion– WorleyParsons, Yarwun, Queensland, Australia

Assessment made of the liquor productivity gain to be expected from the reduction of Organic Carbon concentration in plant liquor via wet oxidation (CAR 2)

Billiton Research, Arnhem, The Netherlands

R&D test work on SCC (stress corrosion cracking) to enable the plant to increase plant liquor caustic concentration in Digestion as a de-bottlenecking opportunity in the Aughinish Alumina Refinery.

R&D Projects -Shell/BHPBilliton, , Billiton Research, Arnhem, The Netherlands

As team leader executed various R&D projects to improve refinery operations efficiency in the areas of liquor productivity and product quality including development and evaluation of various organics removal methods and alternative precipitation flow sheet schemes.

Shell/BHPBilliton, , Billiton Research, The Netherlands, Set up new R&D Facility

After closure of the BHPBilliton R&D facility in Arnhem, a new R&D facility was set up including transfer of laboratory analytical and bench test equipment and training of new staff to perform Bayer process analytical and bench test work.

Greenfield Refinery - BHPBilliton, Office, The Hague, The Netherlands

Conceptual, pre-feasibility and feasibility study, Design of the White Side facilities of the refinery.

Green field Refinery – Global Alumina, Technip Engineering Office, Paris, France

Feasibility study of a low temperature digestion refinery to be built in Guinea, Africa using Sangaredi Gibbsitic type bauxite

Green field Refinery – BHPBilliton, Engineering Office, Bunbury, West Australia

Feasibility study of a low temperature digestion refinery to be built in Guinea, Africa using Bofa Gibbsitic type bauxite

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Green field Refinery – Emirates Global Alumina (EGA),, Engineering Office, Brisbane, Australia

Feasibility study of a low temperature digestion refinery constructed in UAE, Middle East using gibbsitic type bauxite from Guinea, Africa.

Green field Refinery – BHPBilliton, Offices in Suriname and The Netherlands

Feasibility study of a low temperature digestion refinery to be built in West Suriname using Bakhuys deposit type bauxite

Green field Refinery – UC RUSAL, RUSAL Offices in Moscow and St Petersburg

Feasibility study of a low temperature digestion refinery to be built in Guinea, Africa using Dian-Dian deposit Gibbsitic type bauxite

Sherwin Alumina Refinery - Glencore, Corpus Cristi, Texas, USA

Technical Service Agreement to support operations

Aughinish Alumina Refinery – Alcan/Rusal, Askeaton, Ireland

Technical Service Agreement to support operations

Almatis Alumina Refinery-Almatis, Burnside, Louisiana, USA

- Due Diligence leading to the acquisition of the operations
- Alternative bauxite evaluation project-evaluated 6 commercial available bauxites including full laboratory characterization and assessment of processing behavior.

Alunorte Alumina Refinery-BHPBilliton, Barcarena, Brazil

Operations review as part of a Due Diligence

CVG Alumina Refinery – BHPBilliton, Puerto Ordaz, Venezuela, South America

Operations review as part of a Acquisition Due Diligence exercise

Fria Alumina Refinery - Rusal, Frguia, Guinea, Africa

Refinery facility and performance review to identify expansion capability and conversion of product type

Nikolaev Alumina Refinery-Rusal, Nikolaev, Ukraine

Precipitation performance review and design modification to convert from Fluory type alumina to sandy type alumina product

UAZ Alumina Refinery-Rusal, Kamanz Uralsky, Russia

Precipitation performance review and design modification to convert from Fluory type alumina to sandy type alumina product

Confidential Client

Refinery closure and demolition plan

Paranam Alumina Refinery – Government of Suriname,, Paranam, Suriname

Advisory activities to identify and evaluate options to re-start the closed Alumina refinery

INALUM-Indonesian Aluminium , 2.0 Greenfield Alumina Refinery, Indonesia

a) Performed training sessions/workshop on design and operation of state-of-the art alumina refineries with special emphasis on the design and technological aspects

b) Review of EPC bid proposals of a green field refinery based on Chinese Technology

CHALIECO-GAMI, Guiyang Aluminium and Magnesium Research and Engineering Institute, **4.0 Green Field Alumina Refinery Design, China**

Design of the Precipitation Circuits to produce world class metallurgical grade sandy alumina.

Shanxi Xinfa Alumina Refinery, Shanxi Province, China

Proof of Concept (POC) review of technology, operations and equipment performance; Technology, Design and Engineering by China based company, SAMI. **Shenzhen Aluminium and Magnesium Research and Engineering Institute**

Nanshan Alumina Refinery, Shandong Province, China

Proof of Concept (POC) review of technology, operations and equipment performance. Technology, Design and Engineering by China based company, NEUI. **Northern University Engineering and Design Institute**

Nham Co Alumina Refinery, Lam Dong, Vietnam

Proof of Concept (POC) review of technology, operations and equipment performance. Technology, Design and Engineering (full EPC) by China based company, SAMI. **Shenzhen Aluminium and Magnesium Research and Engineering Institute**

Professional History

- Since 2004: During self-employment as, independent international alumina and bauxite consultant a variety of bauxite and alumina projects for different clients worldwide have been executed. The activities include techno-economic evaluation and reviews of operations, Due Diligences, greenfield and brownfield refinery review, design and feasibility studies along with technical support to refineries
- 1989 – 2004: During employment with BHPBilliton International – 15 years' experience was gained in operational and techno-economic support to BHPBilliton co-owned alumina refineries: Aughinish Alumina Refinery in Ireland, Paranam Alumina Refinery in Suriname, Alumar Alumina Refinery in Brazil and Worsley Alumina Refinery in West Australia.

  Key activities as representative of the owner included operational performance review, review and advice on capital and improvement projects proposed by management of the different co-owned refineries. Various Greenfield Refinery feasibility studies and Brownfield expansion studies as well as various acquisition Due Diligences were performed.

  During 5 years in R&D, various refinery improvement processes were developed, and sophisticated simulation models were developed for the mathematical computer simulation notably, of the full refinery and the Precipitation Circuit. A patent for the improvement of the precipitation process was granted.
- 1980 – 1989: During employment with Alcoa/Suralco at the Paranam Alumina Refinery in Suriname, operational and processing experience was gained in the role of process engineer/sr process engineer and head of the technical department respectively.