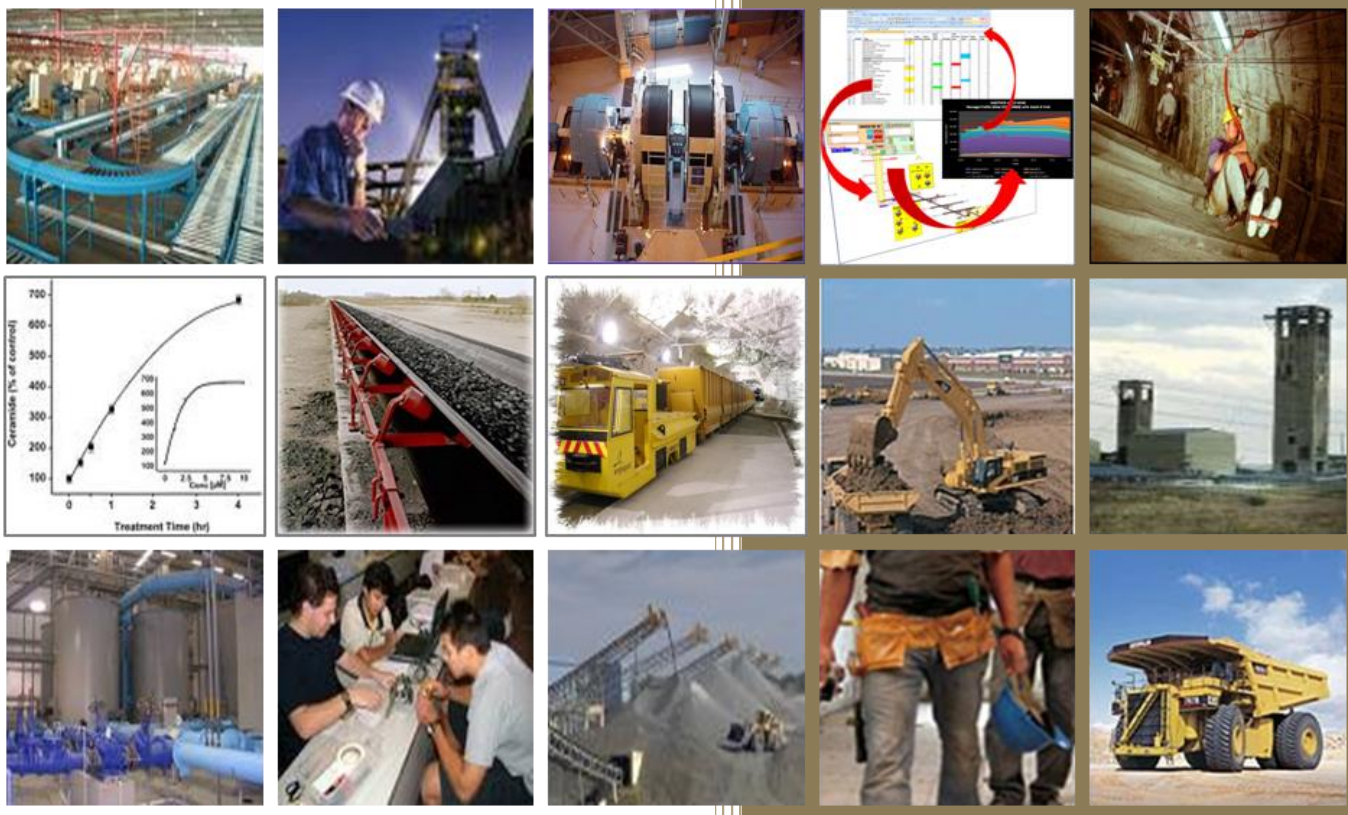
BIECON Industrial Engineering (Pty) Ltd

2018

Company profile & purpose



BIECON Offices

Willow Place

Western Levels, 2501

P. O. Box 1298

Carletonville 2500

REPUBLIC OF SOUTH AFRICA

Tel: +27 18 700 3704/5

Fax: + 27 18 700 3715

www.biecon.co.za

Company Registration number: 2001/018192/07

Directors: DO Botha, NJ Grey and GAJ van Zyl

Company Profile and Purpose

Background

BIECON Industrial Engineering (Pty) Ltd is a high-caliber professional consulting company that specialises in simulation modelling, business process improvement and solution implementation.

Since its establishment in 2005 the company has distinguished itself as a provider of high quality professional services that are delivered on time and within budget. Its success stems from the use of the best industrial engineering and systems engineering skills and expertise. Our people possesses valuable knowledge of mining processes, processing plants, logistic transportation systems, and supportive industries.

Business Principles

Vision

BIECON aspires to be the leading South African Company for providing business solutions and management engineering services to our clients for informed decision making.

Mission

BIECON aims to make a significant and sustainable difference to the profitability of its clients by providing practical and value-adding business solutions. BIECON is an innovative organization committed to assist clients with a project methodology which deliberately involves clients in a step-by-step approach to realize business benefits in such a way that value is unlocked in their organization.

Business Focus

BIECON focuses on the feasibility and justification of large capital projects and operational improvement through unlocking business profitability. The focal point of our group lies in the objective studying of our client's core processes and transferring of knowledge to ensure that our involvement has an enhancing impact on the operational performance of our clients.

Competitive advantage

BIECON has established a strategy that gives their customers a competitive advantage by using simulation and quantitative management techniques, which provide a tool to measure performance levels, safety levels as well as facilitating improved strategy simulation in terms of cost and added value.

BIECON has gained access to a wealth of information and expertise in the mining sector and mining related sectors and has established relationships with a number of mining consulting houses. Our company's quality and sought-after service has earned us the preferred supplier category on most mining houses supplier lists.

The management of BIECON is seeking continuously for new and technological means to ensure that their customers stay globally in front.

Assuring output integrity

The BIECON approach is based on honesty and integrity aiming to provide useful outputs to our clients for informed decision making. The results and predictions of our simulation modelling and studies are of the highest standards ensuring that the process under investigation is indeed evaluated with the sensitivities impacting thereon. Employees of BIECON will investigate and report on issues as it occurs in reality, and handle these reports with the necessary purpose and confidentiality.

Business Services

BIECON started out in the field of Industrial engineering in the mining and steel manufacturing industries. Core competencies, methodologies, technologies and paradigms acquired and refined ever since, have been transferred to many other

fields, giving BIECON a wide application base. Since the focus is on large scale capital projects and/or complex operational systems, our business areas have been defined into specialty and meaningful functions.

Logistic study

Logistic studies involve the measurement and modelling of the handling, storage and delivery of personnel, material, equipment and products (including work in progress) to all parts of the business. The logistic capability of a system, plant or mine usually determines the production constraint, but can be overcome by thoroughly studying and re-engineering. The logistic chain of events (supply chain), from origin to final delivery, requires transportation resources and schedules. The transportation means and schedules are studied and modeled to produce integrated and cost effective logistic plans.

The typical logistic study undergoes a comprehensive work study and analysis of existing systems. This is being followed on by a simulation study or a series of studies to evaluate system capacity and to identify bottlenecks in the supply chain. Alternative handling options are also evaluated and final recommendations to alter and improve the logistic capability of the system under study are forthcoming. Designing or re-designing of transportation and handling features and schedules are also part of the deliverables of the logistic study.

Simulation study

Simulation modeling and analysis entails building an abstract computer model to simulate the behavior of any system, process, future situation or scenario. A computer simulation is an attempt to model a real-life or hypothetical situation on a computer so that it can be studied to see how the system works. By changing variables, predictions may be made about the behavior of the system.

These models are normally used to:

- Predict the impact of business strategy decisions before implementation.
- Determine the production capacity of a process and to identify bottlenecks.

- Optimize production schedules, infrastructure and mine designs.
- Evaluation of the future operational phase of a capital project in order to reduce the risk of the project.

This includes models of mining processes such as underground horizontal transport, ore extraction and development and shaft operations. Currently the *Arena software or Simio software* is used for this purpose but it can include modelling with a spreadsheet application such as Excel.

Work study

Work study consists of time studies and work measurement (time and motion). A time and motion study is a business efficiency technique combining the Time Study work with the Motion Study work. It is a major part of scientific management.

BIECON staff is equipped with advanced tools and techniques to measure the two components. This includes determining the standard time for completion of a task. This is normally used to determine labour complements, planning and scheduling of work, to determine the production capacity of a process and to design or redesign a process. The work study component usually gives a good and valuable insight into the performance of a system or process. Early "wins" during the project evaluation phase is a deliverable of these studies.

Feasibility study

BIECON has form part of many project teams evaluating options for future business operations conducting in feasibility studies.

Feasibility studies investigate the scale of feasibility to which a project can or will be implemented. These studies are conducted to evaluate whether the resources and equipment will fit the purpose or practice in a business model or part thereof.

Technical feasibilities evaluate future infrastructure and equipment capability. The assessment is based on an outline design of system requirements in terms of input, processes, output, fields, programs, and procedures. This can be quantified in terms

of machine or process capability, trends, frequency of updating, etc. in order to estimate whether the new system will perform adequately or not. This means that feasibility is the study of the based plan in outline.

Simulation modelling is often used to do these evaluations, evaluating the system capacity and capability under a set of pre-selected assumptions. These assumptions are then often challenged to show practicality and feasibility.

Economical feasibilities calculate financial terms of envisaged capital expenditure, such as payback periods, IRR and NPV. Economic analysis is the most frequently used method for evaluating the effectiveness of a new system. More commonly known as cost/benefit analysis, the procedure is to determine the benefits and savings that are expected from a candidate system and compare them with costs. If benefits outweigh costs, then the decision is made to design and implement the system. A business must accurately weigh the cost versus benefits before taking an action.

Comparison of various process types and/or equipment types are conducted with relation to technical feasibility for final selection of the project resources.

Client Base

Client	Operation
AngloGold Ashanti Limited	Mponeng mine Tau Tona mine Savuka mine Moab Khotsong mine Kopanang mine Tau Lekoa mine Great Noligwa mine AMTS Geita mine (Tanzania) Obuasi mine (Ghana) Navachab mine (Namibia) ATIC Vaal River surface operations
SibanyeGold	Kloof Gold mine (Ikamva, Hlananathi, Manyano, Thuthukani) Beatrix mine (3 shaft and 4 shaft) Driefontein gold mine (Hlanganani, Pitseng, Bambisanani, Rethabile, Khomanane) KDC West surface transport Medical station (7 shaft)
Goldfields Limited	South Deep mine
Harmony Gold	Khusasalethu mine (Elandsrand mine) Bambanani mine Masimong mine
Rand Gold Resources	Kibali mine (JV) (DRC)
Anglo Platinum	Khuseleka 1 shaft (Townlands) Khuseleka 2 shaft (Boschfontein) Khomanani 1 & 2 shaft (Frank I & II) Siphumelele 1 shaft (Turffontein) Thembelani 2 shaft (Paardekraal) Union mine Tumela mine (Amandelbult) Turk project (future deep mine) Modikwa mine (JV with ARM) Bokoni Mine (JV with Atlatsa)

Lonmin	Hossy shaft Saffy shaft Karee 3 mine Karee 4 mine Rowland mine Newlands shaft Various production declines Surface rock transport Akanani project Surface bus transportation
Impala Platinum	Impala 16 shaft Impala 20 shaft
Rand Uranium	Surface operations Mechanised mining operations
Great Basin Gold	Burnstone mine
BRPM	North mine
Barrick Africa	Sedibelo project
African Barrick Gold	Bulyanhulu mine (Tanzania)
Rand Gold Resources (and AngloGold Ashanti)	Kibali gold mine (DRC)
Palabora Copper (Pty) Ltd	Palabora Copper mine
AEMFC (Coal)	Vlakfontein mine
Wesizwe	Bakubung mine
Gem Diamonds	Ghaghoo Diamond mine (Botswana)
Morobe Mining Joint Ventures (Australia)	Wafi-Golpu mine (Papua New Guinea)
Vedanta Resources	Konkola Copper mine (Zambia)

Partnership	Involvement
RSV Consultants	Sub-contracting
WorleyParsonsRSA (formerly TWP)	Sub-contracting
FOX Consulting	Sub-contracting
CES Group of companies	Sub-contracting
Minxcon projects	Sub-contracting/Training
Project Way	Sub-contracting
DRA Global	Sub-contracting
SRK Consulting	Sub-contracting
Pirran Mining (Australia)	Sub-contracting

Comments: