

# Power Systems and Generation

BEC Engineering is a specialist electrical engineering consultancy providing professional services to the mining, utilities, materials handling, oil and gas, industrial and petrochemical industries.



## Power Systems

All projects are dependent on power system reliability and safety.

Our power systems team is dedicated to providing total engineering services for your network, be it in the resources, industrial or public utilities sectors.

We make it our business to stay abreast of technological change and this is reflected in our system designs, which routinely set industry standards.

### Complete Electrical Power System Design for Generation, Transmission and Distribution

- > Transmission and distribution system design
- > Substation design and construction
- > Protection system design

### Energy Management

- > Determine current system structure and capacities
- > Assessment of power delivery system efficiencies and strategies for optimisation
- > Power factor correction
- > Investigation and design of automation systems for enhanced equipment management
- > Load flow studies and development of strategies for energy management

## Power System Fault Analysis

- > Study and assessment of faults
- > Investigation reports
- > Corrective action recommendations
- > Power system analysis
- > Emergency response to critical failures

## Power Generation

Whether you need to increase power capacity, maximise efficiency or design a new power station, even in the most remote location, BEC has the expertise and the personnel to deliver a solution for you.

BEC has an enviable record on power station projects for mining companies and regional centres throughout Australia and around the world.

By contacting us early in the conceptual stage the benefits and cost savings can be significant. Let us carry out your feasibility study to identify the simplest, most effective solutions.

### Power Station Audits

- > Performance assessment and equipment monitoring
- > Efficiency reviews with regard to fuel, load profiling and load management
- > Operational procedures and compliance with statutory requirements

## Generation Asset Planning

- > Generation capacity review and planning
- > Power station design and project implementation
- > Determination of capacity for generation expansion

## Generation Control Systems

- > Review and design of upgrade and modification options
- > Design and specification of complete generation control systems
- > Development, design and programming operator interface solutions

## Engine Management Systems Design

- > Development of solutions for system upgrades
- > Design of retrofits for engine management systems

## Utility Connection Design and Implementation

- > Utility and supply authority negotiations
- > Design of utility connection protection systems

## Power Services

In addition to the power generation and power system capabilities, we can provide effective solutions and services in the following areas:

- > harmonic distortion analysis;
- > electrical safety audits;
- > insurance and accident investigation;
- > earthing system audits and design; and
- > fault rectification.



Safe systems,  
employee recognition,  
continuous improvement,  
client satisfaction.

### **Agbaou Gold Mine Electrical and Control Systems**

Cote D'Ivoire, Africa

BEC's was engaged by Endeavour Mining to provide the electrical design and construction management for the main sub-station, the power systems, processing plant and the site infrastructure at the Agbaou Gold Mine. BEC also designed and managed the construction of the 90-kilometre power line connection to the operation.

BEC's scope included the following:

- > detailed design of high voltage/power system layout and reticulation; electrical load calculations and maximum demand calculations, cable voltage drops, fault ratings, plant and equipment selection; protection coordination; plant control system; plant and equipment general arrangements; and primary and secondary distribution centres;
- > equipment specifications and procurement for switchgear, control centres, instrumentation; control panels; hardware; and transformers;
- > production of detailed engineering drawings for the various elements; and
- > installation and commissioning.

### **Coal Stockpile Electrical and Control Systems**

Gladstone, QLD, Australia

BEC was engaged by the Gladstone Port Corporation to undertake electrical and instrumentation design, procurement, construction and commissioning for a new conveyor and stacker extension, reclaimers extension, and associated infrastructure.

BEC's scope included the following:

- > detailed design of high voltage/power system layout and reticulation; electrical load calculations and maximum demand calculations, cable voltage drops, fault ratings, plant and equipment selection;

protection coordination; plant control system; protection systems and overall control philosophy; and primary and secondary distribution centres;

- > equipment specifications and procurement for switchgear, control centres, instrumentation, control panels, hardware and transformers; and
- > production of detailed engineering drawings for the various elements.

### **TANESCO Grid Strengthening Project**

Tanzania, Africa

BEC was engaged by Barrick Gold to conduct a study of the TANESCO electricity grid for a connection to the Buzwagi Gold Mine.

After conducting the various feasibility studies and recommending the connection for the Buzwagi mine, BEC was engaged in the conceptual design, project management and commissioning of the 100 kilometres of 220kV powerline and substations for this connection.

BEC's scope included the following:

- > project management for detailed tender document preparation, contract preparation for EPC contractors, procurement, delivery, construction, and testing;
- > feasibility studies and conceptual designs for power lines;
- > detailed discussion with TANESCO for design concept, environment study, land compensation, right of way for the power line, project implementation agreement, and power supply agreement;
- > consultancy design and project management services for overhead power lines and substations
- > powerline and switchgear construction management;
- > testing and commissioning; and
- > handing-over the power line and substation to the grid authority.

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