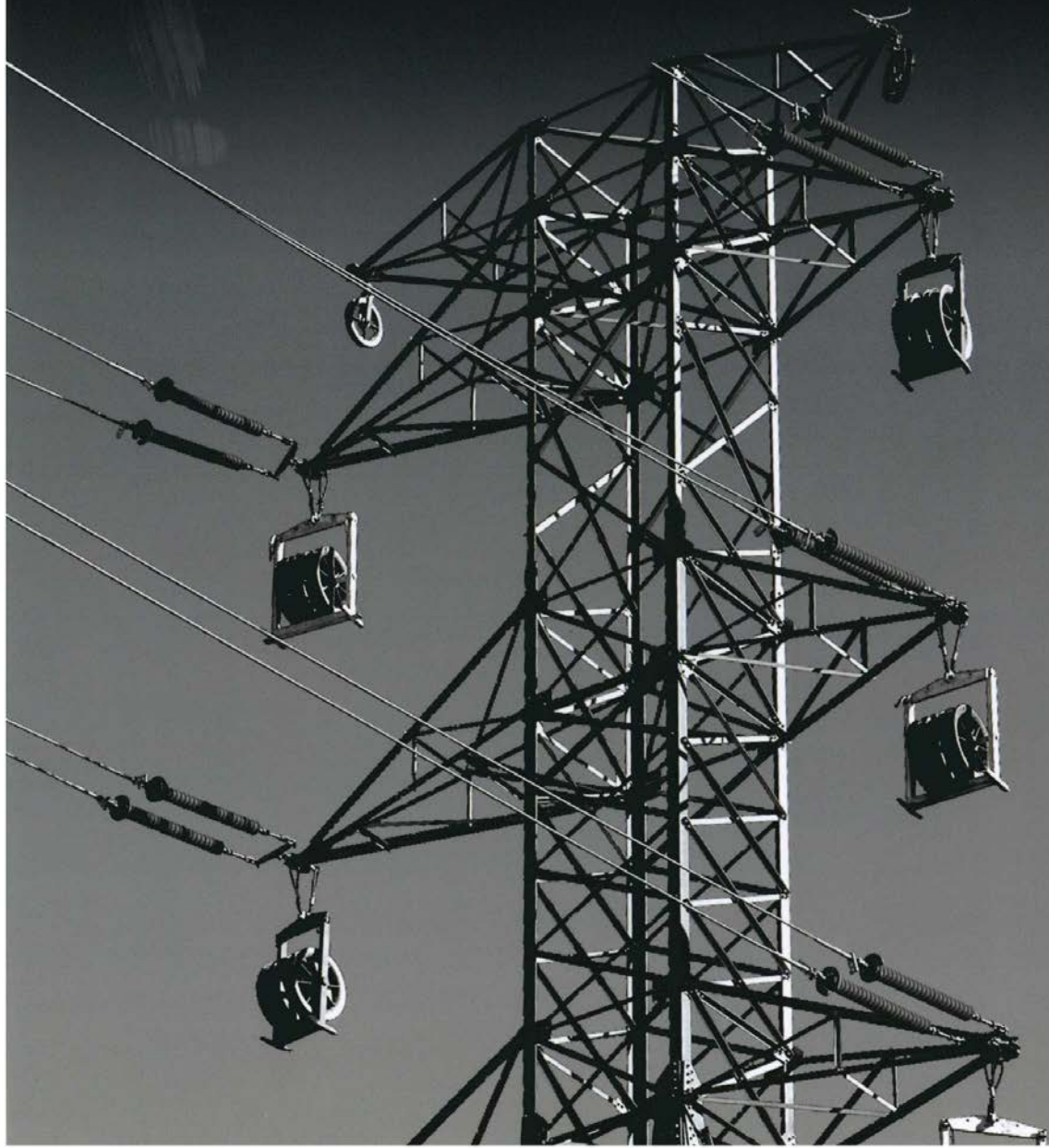




CVG CONSULTING ENGINEERS (Pty) Ltd

EXPANDING PARADIGMS IN ENGINEERING EXCELLENCE



CVG's Portfolio of Projects



CVG Consulting Engineers (Pty) Ltd offers professional Electrical Engineering and Project Management consulting services over a broad spectrum of the industry. The Company's expertise is on the design, project management, construction supervision and quality assurance of high voltage transmission lines and substations. Since inception CVG has successfully designed and project managed the construction of over 80 substations. In addition the successful design and construction, in excess of 10 sub-transmission line projects have been undertaken by the Company.

CVG have recently undertook and completed designs for 2 large Wind Farms projects that are currently in construction phase. The Engineers have experience and expert knowledge on the South African Grid Code requirements and design of substations for interconnection to the National Grid.

This portfolio presents a list relating to high voltage line and substations projects successfully undertaken by the Company. Selected projects have been expanded to provide additional details of the key elements of works in which the highly qualified staff are skilled in.



RENEWABLE ENERGY PROJECTS

Project Details *Salient Features and Project Involvement*

2012/2013

**Dassiesklip 66/22kV
Substation**

**Client:
Iberdrola y Construcción
& Group Five JV**

SA Grid Code Studies and Design of Interconnection Substation and Power Line 27MW Wind Farm near Caledon, Western Cape

Grid Code Compliance and Compilation of Protection, Metering, Telecontrol and Telecommunication Philosophies

- Ensure that all infrastructure is planned and designed to ensure compliance with South African Grid Codes
- Protection, Metering, DC & AC Distribution, Telecontrol in Eskom portion of the facility
- Protection, Metering, DC & AC Distribution, Telecontrol in Wind Farm portion of the facility

Preliminary and Detailed Primary Plant Design

- Design of Bulk Civil Works, Access Roads, Drainage, etc of Substation platform to accommodate Eskom 66kV Switch Yard, as well as Wind Farm 66/22kV Collector Substation
- Design of Substation Buildings (Eskom & Wind Farm Side)
- Substation earth mat design for entire High Voltage Yard
- Specification of all major High Voltage equipment, layout, elevations, stringing, etc
- MV Switchgear Specification & Electromechanical works for Substation

Preliminary and Detailed Control Plant Design

- Protection for all power plant equipment which includes
- Phase 4-Distance/Current Differential Protection schemes, Phase 4-transformer and tap changer protection and control schemes, Phase 4-11 kV Reticulation feeder protection schemes, Phase 4 Buszone protection schemes
- AC and DC Auxiliary Supplies & Distribution
- Sizing and design for AC and DC distribution panels and substation batteries
- Substation Statistical and Tariff Metering
- Teleprotection for 66kV Lines
- Complete Substation Automation for SCADA, Remote Engineering Access and Time Synchronization
- Integration of weather forecast data to ensure grid code compliance

Turn in Line Design

- Tower spotting, Line Profiles & Tying into existing Eskom line
- PLS CAD Work, Stringing charts, tower selection, etc
- Specification of all components, constructability, etc
- Foundation design & Geotechnical aspects

2012/2013

**Noblesfontein
132/33kV Substation**

**Client:
Iberdrola y Construcción
& Group Five JV**

SA Grid Code Studies and Design of Interconnection Substation and Power Line 70MW Wind Farm near Victoria West, Northern Cape

Grid Code Compliance and Compilation of Protection, Metering, Telecontrol and Telecommunication Philosophies

- Ensure that all infrastructure is planned and designed to ensure compliance with South African Grid Codes
- Protection, Metering, DC & AC Distribution, Telecontrol in Eskom portion of the facility
- Protection, Metering, DC & AC Distribution, Telecontrol in Wind Farm portion of the facility

Preliminary and Detailed Primary Plant Design

- Design of Bulk Civil Works, Access Roads, Drainage, etc of Substation platform to accommodate Eskom 66kV Switch Yard, as well as Wind Farm 66/22kV Collector Substation
- Design of Substation Buildings (Eskom & Wind Farm Side)
- Substation earth mat design for entire High Voltage Yard
- Specification of all major High Voltage equipment, layout, elevations, stringing, etc
- MV Switchgear Specification & Electromechanical works for Substation

Preliminary and Detailed Control Plant Design

- Protection for all power plant equipment which includes
- Phase 4-Distance/Current Differential Protection schemes, Phase 4-transformer and tap changer protection and control schemes, Phase 4-11 kV Reticulation feeder protection schemes, Phase 4 Buszone protection schemes
- AC and DC Auxiliary Supplies & Distribution
- Sizing and design for AC and DC distribution panels and substation batteries
- Substation Statistical and Tariff Metering
- Teleprotection for 66kV Lines
- Complete Substation Automation for SCADA, Remote Engineering Access and Time Synchronization
- Integration of weather forecast data to ensure grid code compliance

Turn in Line Design

- Tower spotting, Line profiles & Tying into existing Eskom Line
- PLS CAD Work, Stringing charts, tower selection, etc
- Specification of all components, constructability, etc
- Foundation design & Geotechnical aspects

TRANSMISSION LINE PROJECTS

Project Details

Salient Features and Project Involvement

2010

Sub Consultant for Design Activities to Edison Jehamo Power (Pty) Ltd

**Wildebbeest-Hatherley
132kV Line**

PLS CADD Design for 2.5km double circuit steel lattice twin Tern line

- Feature Coding
- Tower Spotting
- Line Profiling
- Blowout and Clearance Calculations
- PLS CADD structure files
- Conductor and OPGW criteria files
- Staking Reports

Client:
City of Tshwane
Municipality

2010

Sub Consultant for Design Activities to Edison Jehamo Power (Pty) Ltd

**Wildebbeest-Eland
132kV Line 1**

PLS CADD Design

- Feature Coding
- Tower Spotting
- Line Profiling
- Blowout and Clearance Calculations
- PLS CADD structure files
- Conductor and OPGW criteria files
- Staking Reports

Client:
City of Tshwane
Municipality

2010

Sub Consultant for Design Activities to Edison Jehamo Power (Pty) Ltd

**Wildebbeest-Eland
132kV Line 2**

PLS CADD Design

- Feature Coding
- Tower Spotting
- Line Profiling
- Blowout and Clearance Calculations
- PLS CADD structure files
- Conductor and OPGW criteria files
- Staking Reports

Client:
City of Tshwane
Municipality

2010

Sub Consultant for Design Activities to Edison Jehamo Power (Pty) Ltd

**Hatherley-Mamelodi
132kV Line**

PLS CADD Design

- Feature Coding
- Tower Spotting
- Line Profiling
- Blowout and Clearance Calculations
- PLS CADD structure files
- Conductor and OPGW criteria files
- Staking Reports

Client:
City of Tshwane
Municipality

2010

Project Management Appointment

**Gingindlovu 132kV Turn
In Lines**

132kV turn-in lines to Gingindlovu 132/88/22/11kV S/S

- Scope definition
- Management of the EIA process
- The downgrading of 275kV lines & the establishment of new 132kV turn-in lines.
- Management of Tender process (Compilation and adjudication of tenders)
- Construction project management

Client:
Eskom Distribution
Eastern Region

TRANSMISSION LINE PROJECTS

Project Details

Salient Features and Project Involvement

2009

Turnkey Appointment on Joint Venture with Edison Jehamo Power (Pty) Ltd

**Eros – Oribi
132kV Line**

Project Designer and Quality Assurance for 55km double circuit twin Chicadee line with OPGW on one circuit. Self supporting steel lattice structures of 231A, 247A & 245 Series towers

Client:
Eskom Distribution
Eastern Region

- Management of the Environmental Impact Assessment
- PLS CADD design.
Feature Coding, Tower Spotting, Line Profiling, Blowout and Clearance Calculations, PLS CADD structure files, Conductor and OPGW criteria files, sag and tension charts
- Detailed Design Package
Generation of all detailed designs for towers, conductors, OPGW, insulators, vibration dampers, anti-climbing devices, bird guards, aircraft marker spheres and all associated hardware
- Quality Assurance of the Line

2008

Sub Consultant for Design Activities to PB Power

**Phokoje – Maraphile
400kV line (Botswana)**

PLS CADD Design

- *Feature Coding*
- *Tower Spotting*
- *Line Profiling*
- *Blowout and Clearance Calculations*
- *PLS CADD structure files*
- *Conductor and OPGW criteria files*
- *Staking Reports*
- *Line Templating*

Client:
PB Power

2007

Project Management Appointment

**Makhatini - Nondabuya
132kV Line**

17.5km of Kingbird 132kV Line and 7/3.35 earth wire on a mixture of self supporting and guyed lattice steel structures.

Client:
Eskom Distribution
Eastern Region

- *Co-ordination and planning of Preliminary and detailed design. Co-ordination of and input into Environmental Impact Assessments and compilation of Environmental Management Plan.*
- *Tender documentation, tender adjudication*
- *Construction supervision, Quality Assurance management*
- *Co-ordination of environmental monitoring, outage planning, co-ordination and monitoring.*

2006

Project Management Appointment

**Bloedrivier-Emondlo
88kV Line**

Single Circuit 14km Wolf 132kV Line

- *Co-ordination and planning of Preliminary and detailed design. Co-ordination of and input into Environmental Impact Assessments and compilation of Environmental Management Plan.*
- *Tender documentation, tender adjudication*
- *Construction supervision, Quality Assurance management*

Client:
Eskom Distribution
Eastern Region

TRANSMISSION LINE PROJECTS

Project Details

Salient Features and Project Involvement

2006

Project Management Appointment

Idwala – Oribi 132kV Line

8.5km Dual Circuit Tee-Off from the Nkonka-Oribi 132kV Wolf line with 7/3.65 earth wire on one circuit and OPGW and the 2nd .Self supporting series 245 steel lattice tower

Client:
Eskom Distribution
Eastern Region

- Co-ordination and planning of Preliminary and detailed design. Co-ordination of and input into Environmental Impact Assessments and compilation of Environmental Management Plan.
- Tender documentation, tender adjudication
- Construction supervision, Quality Assurance management
- Co-ordination of environmental monitoring, outage planning, co-ordination and monitoring.

2005

Project Management Appointment

Wesselsnek-Ekuvukeni 88kV Line

13km of lattice steel 88kV line

Client:
Eskom Distribution
Eastern Region

- Co-ordination and planning of Preliminary and detailed design. Co-ordination of and input into Environmental Impact Assessments and compilation of Environmental Management Plan.
- Tender documentation, tender adjudication
- Construction supervision, Quality Assurance management
- Co-ordination of environmental monitoring, outage planning, co-ordination and monitoring.

2002

Project Management Appointment

Nkonka - Scottburgh 88kV line

- Co-ordination and planning of Preliminary and detailed design. Co-ordination of and input into Environmental Impact Assessments and compilation of Environmental Management Plan.
- Tender documentation, tender adjudication
- Construction supervision, Quality Assurance management

Client:
Eskom Distribution
Eastern Region

2001

Project Management Appointment

Uvongo - Montreux 88kV line and cable

- Co-ordination and planning of Preliminary and detailed design. Co-ordination of and input into Environmental Impact Assessments and compilation of Environmental Management Plan.
- Tender documentation, tender adjudication
- Construction supervision, Quality Assurance management

Client:
Eskom Distribution
Eastern Region

SUBSTATION PROJECTS

Project Details

Salient Features and Project Involvement

2008 - 2010

**Gingindlovu
132/88/22/11-kV
Substation Establishment**

**Client:
Eskom Distribution Eastern
Region**

**Project Value:
R 88.1 million**

Turnkey Appointment

Preliminary and Detailed Primary Plant Design

- Substation Site, drainage, elevations, and setting out for:
Double 132kV Busbar with Buscoupler, Double 88kV Busbar with Buscoupler, 2 x 132kV Line Bays with Single Pole Tripping, 3 x 88kV Line Bays, 2 x 80MVA 132/88/22kV Transformers + OLTC, 1 x 20MVA 132/11kV Transformer + OLTC, 5 x 11kV Feeder Bays
- Substation earth mat design
- Control Room building and yard fencing design
- Access roads

Preliminary and Detailed Control Plant Design

- Protection for all power plant equipment which includes
- Phase 4-Distance/Current Differential Protection schemes, Phase 4-transformer and tap changer protection and control schemes, Phase 4-11 kV Reticulation feeder protection schemes, Phase 4 Buszone and Buscoupler protection schemes
- AC and DC Auxiliary Supplies
- Sizing and design for AC and DC distribution panels and substation batteries
- Substation Statistical Metering
- Teleprotection for 132kV Lines
- Complete Substation Automation for SCADA, Remote Engineering Access and Time Synchronisation

Project Management and Construction Supervision

- Compilation of all tender documents and evaluation of Tenders
- Complete Project Management of the construction works
- Construction supervision

Turnkey Appointment

2008 - 2010

**Mandini
Additional 132kV Line
Bays and Substation
Refurbishment**

**Client:
Eskom Distribution Eastern
Region**

**Project Value:
R 39.7 million**

Preliminary and Detailed Primary Plant Design

- Extension to Substation Site, drainage, elevations, and setting out for:
- Extension of Double 132kV Busbar with Buscoupler, 2 x new 132kV Line Bays with Single Pole Tripping with additional space for 6 x 132kV future Line Bays, 1 x 20MVA 132/11kV Transformer + OLTC, 5 x 11kV Feeder Bays
- Decommissioning of:
- 48MVar capacitor bank; 2 x 15MVA 132/88/6.6kV transformers + OLTC; 11kV Indoor switchboard.
- Substation earth mat design
- Complete refurbishment of primary plant equipment (CT's, VT's, isolators, insulators, hardware and conductors)
- Replacement of Yard fencing
- Access Roads

Preliminary and Detailed Control Plant Design

- Complete Protection Upgrade and Refurbishment
- Decommissioning of all existing protection schemes and replacement with:
- Phase 4-Distance/Current Differential Protection schemes, Phase 4-transformer and tap changer protection and control schemes, Phase 4-11 kV Reticulation feeder protection schemes, Phase 4 Buszone and Buscoupler protection schemes.
- AC and DC Auxiliary Supplies
- Sizing and design for AC and DC distribution panels and substation batteries
- Substation Statistical and Tariff Metering
- Teleprotection for 132kV Lines
- Complete Substation Automation for SCADA, Remote Engineering Access and Time Synchronisation

Project Management and Construction Supervision

- Compilation of all tender documents and evaluation of Tenders
- Complete Project Management of the construction works
- Construction supervision

SUBSTATION PROJECTS

Project Details

Salient Features and Project Involvement

Turnkey Appointment

2009 - 2010

**Driefontein
132/33/22/11-kV
Substation
Refurbishment**

Client:
Eskom Distribution Eastern
Region

Project Value:
R 18.1 million

Preliminary and Detailed Primary Plant Design

- Modification to 132kV busbar columns and beams
- Decommissioning of:
 - 33kV Line VT's and NEC's on both 40MVA 132/33kV transformers 1 and 2; 33kV feeder bay 3 to Kwadukuza Municipality; line VT's on 33kV feeder bays 1 and 2 to Kwadukuza Municipality, 11kV NB22, 11kV auxiliary transformer
- Establishment of:
 - New CT's, circuit breakers, isolators and NECRT's in transformer 1 and 2 bays and transformer 11 bay
 - New 11kV NB22 feeder
 - New 33kV and 11kV busbar VT's
- Replacement of all glass insulators, hardware and restringing of substation bays

Preliminary and Detailed Control Plant Design

- Upgrade of all Protection which includes
 - Phase 4-transformer and tap changer protection and control schemes, Phase 4 - 33 kV Reticulation feeder protection schemes, Phase 4 - 11 kV Reticulation feeder protection schemes,
 - AC and DC Auxiliary Supplies
 - Sizing and design for AC and DC distribution panels and substation batteries
 - Substation Statistical and Tariff Metering
 - Complete Substation Automation for SCADA, Remote Engineering Access and Time Synchronisation

Project Management and Construction Supervision

- Compilation of all tender documents and evaluation of Tenders
- Complete Project Management of the construction works
- Construction supervision

2010

Design Appointment for Substation Platform

**Mfinizo and Taweni
Substation
Platform Designs**

Client:
Eskom Distribution
Southern Region

Project Value:
R 39.7 million

Site Platform and Access Design

- Site investigation to undertake:
 - geotechnical assessment of soil conditions
 - soil resistivity tests
 - environmental impact assessment
- Design of the new access roads off the R61 road to Lusikisiki
- Design of the new platforms based on results obtained from the geotechnical survey and soil resistivity tests; and done to SABS 1200.

Turnkey Appointment

2007 - 2009

**Oribi 132/88/11kV
Substation
Additional 132kV Line
Bays**

Client:
Eskom Distribution Eastern
Region

Project Value:
R 11.8 million

Preliminary and Detailed Primary Plant Design

- Detailed design to extension of Substation Terrace and Yard to accommodate an additional 4 x 132kV Line Bays (2 Line Bays fully equipped and 2 line bays vacant for future use)
- Earth mat design
- Extension of 132kV double busbar
- Installation of Line Traps and Coupling Capacitors on 2 x 132kV Line Bays
- Conversion of existing 132kV incoming line bay to an outgoing 132kV line bay to a new substation
- Fencing of substation yard

Preliminary and Detailed Control Plant Design

- Design of 132kV Distance feeder protection schemes using REL 511 relays
- Design of teleprotection using Power Line Carrier and X.21 over Fibre Optic
- AC and DC Auxiliary Supplies and Statistical Metering
- Pilot Design for complete Substation Automation for SCADA, Remote Engineering Access and Time Synchronisation

Project Management and Construction Supervision

- Compilation of all tender documents and evaluation of Tenders
- Complete Project Management of the construction works and complete construction

SUBSTATION PROJECTS

Project Details

Salient Features and Project Involvement

Design and Project Management Appointment

2004 - 2006

**Idwala 132/11-kV
2 x 20MVA Substation
Establishment**

Client:
Eskom Distribution Eastern
Region

Project Value:
R 14.5 million

Preliminary and Detailed Primary Plant Design

- New 132/11kV, 2 x 20MVA Substation
- 2 x 132kV Line Bays (one equipped with a line trap and coupling capacitor)
- 2 x 11kV Line Bays
- 132kV busbar
- Earthmat design
- Substation control room design
- Yard fencing and access

Substation was erected for a direct customer; Idwala Carbonates who elected to construct the substation platform.

Preliminary and Detailed Control Plant Design

- 132kV Distance Protection scheme on the Nkonka feeder with Power Line Carrier
- 132kV Current differential scheme on the second 132kV feeder
- Phase 3-transformer and tap changer protection and control scheme
- Phase 3 high impedance 132kV buszone scheme
- Fibre optic communication for the 2nd 132kV feeder
- Telecontrol Design using DRTU
- Sizing and design for AC and DC distribution panels and substation batteries
- Substation Statistical and Tariff metering

Project Management and Construction Supervision

- Compilation of all tender documents and evaluation of Tenders
- Complete Project Management of the construction works
- Construction supervision

Turnkey Appointment

2005 - 2007

**Nondabuya 132/22-kV
20MVA Substation
Establishment**

Client:
Eskom Distribution Eastern
Region

Project Value:
R 14 million

Preliminary and Detailed Primary Plant Design

- New 132/22kV, 20MVA Substation
- Substation Site, level and drainage design
- 1 x 132kV Line Incoming Line Bay from Makhathini substation
- 1 x 132kV Line Line Bay to Ndumo substation
- 132kV busbar
- 22kV busbar with transfer capabilities
- 4 x 22kV Line Bays
- Earthmat design
- Substation control room design
- Yard fencing and access

Preliminary and Detailed Control Plant Design

- 132kV Distance Protection schemes
- Phase 3-transformer and tap changer protection and control scheme
- Sizing and design for AC and DC distribution panels and substation batteries
- Telecontrol Design using DRTU
- Substation Statistical and Tariff metering

Project Management and Construction Supervision

- Compilation of all tender documents and evaluation of Tenders
- Complete Project Management of the construction works
- Construction supervision

SUBSTATION PROJECTS

Project Details

Salient Features and Project Involvement

Turnkey Appointment

2004 - 2006

Cato Ridge 88/11kV, Strengthening

Client:
Eskom Distribution Eastern
Region

Project Value:
R 9 million

Preliminary and Detailed Primary Plant Design

- Establishment of a new 88/11kV 20MVA transformer bay
- Establishment of a new 88/11kV 10MVA transformer bay (relocation of existing 10MVA transformer to new transformer bay)
- New 11kV busbar using A-Frames
- Decommissioning of 2 x 2.5MVA transformers
- Replacement of all insulators, hardware and conductors in the substation
- New columns and beams for the 88kV configuration
- Improvements to the access roads, kerbing and yard stoning
- Earthmat design
- Modification to the existing substation control room to house new protection equipment
- Yard fencing

Preliminary and Detailed Control Plant Design

- New transformer and tap changer control and protection schemes
- Telecontrol Design using DRTU
- Sizing and design for AC and DC distribution panels and substation batteries
- Substation Statistical and Tariff metering

Project Management and Construction Supervision

- Compilation of all tender documents and evaluation of Tenders
- Complete Project Management of the construction works
- Construction supervision

2004 - 2006

Primary Plant Design and Project Management Appointment

Emondlo 88/22-kV 20MVA Substation Establishment

Client:
Eskom Distribution Eastern
Region

Project Value:
R 8.4 million

Preliminary and Detailed Primary Plant Design

- New 88/22kV, 20MVA Substation
- 22kV busbar
- 4 x 22kV Feeder
- Substation Site, level and drainage design
- Earthmat design
- Substation control room design
- Yard fencing and access

Project Management and Construction Supervision

- Compilation of all tender documents and evaluation of Tenders
- Complete Project Management of the construction works
- Construction supervision

2003 - 2005

Primary Plant Design and Project Management Appointment

Ekuvukeni 88/22/11-kV 10MVA Substation Establishment

Client:
Eskom Distribution Eastern
Region

Project Value:
R 10 million

Preliminary and Detailed Primary Plant Design

- New 88/22kV, 10MVA Substation
- 22kV busbar with transfer capabilities
- 5 x 22kV Feeder
- Substation Site, level and drainage design
- Earthmat design
- Substation control room design
- Yard fencing and access

Project Management and Construction Supervision

- Compilation of all tender documents and evaluation of Tenders
- Complete Project Management of the construction works
- Construction supervision

SUMMARY OF SUBSTATION PROJECTS COMPLETED

<i>Project Details</i>	<i>Client</i>	<i>Extent of Involvement</i>	<i>Status/Dates</i>
132 kV SUBSTATIONS			
<i>Msunduzi Switching Substation (16 x 132kV Bays) : New Substation</i>	Eskom Distribution	Tender documentation and Project Management	Complete 1997
<i>Bendigo 20 MVA, 132/22kV Substation : New Substation</i>	Eskom Distribution	Planning proposal, Detailed design and Project management	Complete 1997
<i>Turn-in lines to Bendigo Substation</i>	Eskom Distribution	Planning, route selection	Complete 1997
<i>Nkonka 132/88kV Substation : Modification of existing substation</i>	Eskom Distribution	Planning proposal for introduction of bus coupler and long term planning	Complete 1998
<i>Feralloys 2 x 80MVA, 132/33kV Substation : Modification of existing substation — new transformer breakers and protection</i>	Eskom Distribution	Detailed design and contract management	Energised May 1997
<i>Nseleni 132 / 22 kV 20 MVA New Substation</i>	Eskom Distribution	Detailed design and project management	Energised 1999
<i>Mount Frere 132 / 22 kV 20 MVA New Substation</i>	Eskom Distribution	Tender document and project management	Energised 1999
<i>Makhatini 132 / 22 kV Substation – Upgrade from 10 to 20MVA, new line bay & general refurbishment</i>	Eskom Distribution	Detailed Design & Project management	Energised 2003
<i>Nondabuya 132 / 22 kV 20MVA – New Substation</i>	Eskom Distribution	Detailed Design & Project management	Energised 2007
<i>Makhatini / Nondabuya 132kV Line – 20km of new steel lattice tower power line</i>	Eskom Distribution	Project Management	Completed 2007
<i>Madungela 132/11/22kV, 20/5MVA Substation – refurbish & switchgear replacement</i>	Eskom Distribution	Design & Project Management	Complete 2004
<i>Sitilo 132/11/22kV, 20/5MVA Substation – refurbish & switchgear replacement</i>	Eskom Distribution	Design & Project Management	Complete 2004
<i>Leaches Bay 132/11kV 2 x 20MVA New Substation</i>	Eskom Distribution	Project Management & Control Plant Design	Energised 2004
<i>Vlaklaagte 132/33/11kV, 40/20MVA Upgrade & Refurbish</i>	Eskom Distribution	Design & Project Management	Complete 2005
<i>Idwala 132/11kV, 2 x 20MVA new substation & 132kV double circuit line</i>	Eskom Distribution	Design & Project Management	Complete 2005
<i>Colenso 132/88/11kV, 80/5MVA – Refurbishment</i>	Eskom Distribution	Design & Project Management	Complete 2006
<i>Spioenkop 132/22kV, 10 MVA Substation – Refurbish</i>	Eskom Distribution	Design & Project management	Complete 2007
<i>Makhatini S/S : 132kV line bay & 18km 132kV line to Nondabuya S/S</i>	Eskom Distribution	Design & Project management	Complete 2007
<i>Nondabuya 132/11kV, 20MVA S/S</i>	Eskom Distribution	Design & Project management	Complete 2007
<i>Qamata 132/22kV, 2 x 20MVA, new substation</i>	Eskom Distribution	Control plant detailed design	Complete 2006
<i>Dreunberg 132/66/22kV, 40 & 20MVA, refurbishment</i>	Eskom Distribution	Control plant detailed design	Complete 2006
<i>Albany 132/66/22kV, 2 x 40MVA & 20MVA, refurbishment</i>	Eskom Distribution	Control plant detailed design	Complete 2007
<i>Qumbu 132/22kV, 132kV Fdr (OPGW), remote access, recorder</i>	Eskom Distribution	Control plant detailed design	Complete 2007
<i>Zimbane 132/66/22kV, 40MVA Trfr & 132kV Fdr (X21), remote access & recorder</i>	Eskom Distribution	Control plant detailed design	Completed 2008
<i>Ugie 132/22kV 2 x 20MVA, new substation</i>	Eskom Distribution	Control plant detailed design	Completed 2007
<i>Idutywa 132/22kV, 2 x 20MVA, new substation</i>	Eskom Distribution	Control plant detailed design	Completed 2007

Project Details	Client	Extent of Involvement	Status/Dates
132 kV SUBSTATIONS			
<i>Butterworth 132/66/22kV, 132kV Fdr & 2 x 66kV Fdr's, remote access, recorder</i>	Eskom Distribution	Control plant detailed design	Completed 2008
<i>Tyalara 132/66kV, refurbishment – 2x132kV Fdr, 2x40MVA Trfr, 1x66kV Fdr</i>	Eskom Distribution	Control plant detailed design	Completed 2008
<i>Komani 132/66/22kV, 3x40MVA Trfr & 66kV Fdr, 66kV Coupler, remote access & recorder</i>	Eskom Distribution	Control plant detailed design	In construction
<i>Chatty 132kV, refurbish 2x132kV Fdr's, remote access</i>	Eskom Distribution	Control plant detailed design	In construction
<i>Eros – Oribi 132kV 55km double circuit line</i>	Eskom Distribution	Design & Turnkey construction	Completed 2009
<i>Mandini 132/88/11kV S/S – refurbish & upgrade</i>	Eskom Distribution	Detailed design & Project management	Completed 2011
<i>Melkspruit 132/66/22kV, 40MVA & 2x20MVA Trfr, 132kV Fdr, 4x22kV Fdr, remote access & recorder</i>	Eskom Distribution	Control plant detailed design	Completed 2011
<i>Oribi S/S 132kV bay extensions</i>	Eskom Distribution	Detailed design & Project management	Completed 2009
<i>Gingindlovu 132/88/11kV, 2x80+20MVA, new substation & turn-in lines</i>	Eskom Distribution	Detailed design & Project management	Completed 2011
<i>Hlobo 132/22kV Substation – Vuyani 132kV Feeder</i>	Eskom Southern Region	Control plant detailed design	Completed 2011
<i>Driefontein 132/33/22/11kV S/S Refurbishment</i>	Eskom Distribution	Detailed design & Project management	Completed 2011
88 and 66kV SUBSTATIONS			
<i>Widenham 20 MVA, 88/22kV Substation</i>	Eskom Distribution	Planning proposal, Detailed design and Project management	Energised September 1996
<i>Umzinto 20 MVA, 88/22kV and 10 MVA 88/11kV Substation</i>	Eskom Distribution	Planning proposal and network development plan	Energised February 1997
<i>Kingsdale 10 MVA, 88/22kV Substation</i>	Eskom Distribution	Planning proposal for modifications from 88/11kV	Planning complete February 1996
<i>Montreux Substation : New 20 MVA, 88/11kV Substation</i>	Eskom Distribution	Detailed design and project management	Energised May 2001
<i>Wesselsnek Upgrade and Refurbishment – 88/22kV, 5 MVA and 88/11kV, 2.5 MVA</i>	Eskom Distribution	Planning, detailed design and project management	Energised May 2001
<i>Uvongo Substation – New 88kV Feeder Bay & complete refurbishment of existing Protection</i>	Eskom Distribution	Planning, detailed design and project management	Energised May 2001
<i>Uvongo / Montreux 88kV line and cable</i>	Eskom Distribution	Planning detailed design and project management	Complete 2001
<i>Scottburgh 20 MVA 88/22kV Substation</i>	Eskom Distribution	Planning, detailed design and project management	Energised 2002
<i>Nkonka / Scottburgh 88kV line</i>	Eskom Distribution	Planning, detailed design and project management	Energised 2002
<i>Glencoe 40MVA 88/11kV Substation – Refurbishment</i>	Eskom Distribution	Planning, detailed design and project management	Energised 2003
<i>Pieters 10MVA 88/11 Substation – Refurbishment</i>	Eskom Distribution	Planning, detailed design and project management	Energised March 2004
<i>Riebeeck 66/22kV Substation Control Plant Design</i>	Eskom Distribution	Design of control plant installation (protection, DC, telecomms etc)	Complete 2003
<i>Colesberg 66/11kV substation</i>	Eskom Distribution	Design of control plant installation (protection, DC, telecomms etc)	Complete 2004
<i>Minor Upgrades to 7 substations in Northern Natal</i>	Eskom Distribution	Planning, detailed design and project management	Energised 2003

Project Details	Client	Extent of Involvement	Status/Dates
88 and 66kV SUBSTATIONS			
<i>Ekuvukeni 88/22/11kV Substation (10/5MVA) – Establish</i>	Eskom Distribution	Planning, detailed design and project management	Complete 2005
<i>Wesselsnek / Ekuvukeni 88kV Line – 13km of lattice steel power line</i>	Eskom Distribution	Planning & project management	Complete 2005
<i>Refurbishment of 4 x 88kV traction stations</i>	Eskom Distribution	Planning, detailed design and project management	Complete 2007
<i>St James 88/22kV Substation – New Feeder bay & Refurb</i>	Eskom Distribution	Project management	Complete 2006
<i>Emondlo 88/22kV, 20MVA Substation Establishment</i>	Eskom Distribution	Project management	Complete 2006
<i>Bloedrivier/Emondlo 88kV Line – 14km 1 x Wolf</i>	Eskom Distribution	Project management	Complete 2006
<i>Cato Ridge 88/11kV, 20MVA, refurbish & upgrade substation</i>	Eskom Distribution	Planning, detailed design and project management	Complete 2007
<i>Yellowoods 66/11kV Substation Control Plant refurbishment</i>	Eskom Southern Region	Detailed Control Plant Design	Completed 2010
<i>First Falls 66/22kV, 10MVA refurbish & upgrade</i>	Eskom Distribution	Control plant detailed design	Complete 2007
<i>Cintsa 66/11kV, 2x10MVA, refurbishment & remote access</i>	Eskom Distribution	Control plant detailed design	Complete 2007
<i>Elliot 66/22kV, 2x 66kV Fdr (OPGW)</i>	Eskom Distribution	Control plant detailed design	Complete 2008
<i>Whitney 66/22kV, 2x10MVA, refurbishment</i>	Eskom Distribution	Control plant detailed design	Complete 2008
<i>Wilo 66/22kV, 2x20MVA, new substation, remote access & recorder</i>	Eskom Distribution	Control plant detailed design	Complete 2008
<i>Greenacres 66/11kV, 2x20MVA, refurbishment</i>	Eskom Distribution	Control plant detailed design	Complete 2009

33 kV SUBSTATIONS

<i>Elisabeth 10 MVA, 33/11kV Substation : Modification of 11kV switching substation into transformer substation</i>	Eskom Distribution	Detailed design and contract management	Complete & energised 1994
<i>Georgina 10 MVA, 33/11kV Substation : Modification of 11kV switching substation into transformer substation</i>	Eskom Distribution	Detailed design and contract management	Complete & energised 1994
<i>Keswick 10 MVA, 33/11kV Substation : Modification of 11kV switching substation into transformer substation</i>	Eskom Distribution	Detailed design and contract management	Complete & energised 1996
<i>Mpolweni 33/11 kV 10 MVA : Upgrade</i>	Eskom Distribution	Detailed design and contract management	Complete 1998
<i>Feralloys 33kV : Rebuild of outdoor yard</i>	Feralloys	Design and contract management	Complete 1998
<i>Feralloys 33/11kV : Further additions and alterations to yard</i>	Feralloys	Planning, Detailed design and project management	Complete 2001
<i>Feralloys 33/11kV auxiliary supply : Upgrade transformers to 2 x 10 MVA</i>	Feralloys	Planning, Detailed design and project management	Complete 2001
<i>Elisabeth 33/11kV 10MVA Substation : replacement of 11kV indoor switchboard, upgrade of all protection & ...</i>	Eskom Distribution	Planning, Detailed design and project management	Complete 2008
<i>Georgina 33/11kV 10MVA Substations : replacement of 11kV indoor switchboard, upgrade of all protection & ...</i>	Eskom Distribution	Planning, Detailed design and project management	Complete 2008
<i>Keswick 33/11kV 10MVA Substations : replacement of 11kV indoor switchboard, upgrade of all protection & ...</i>	Eskom Distribution	Planning, Detailed design and project management	Complete 2009
<i>Feralloys 33/11kV auxiliary supply : Upgrade transformers to 4 x 10 MVA</i>	Feralloys	Planning, Detailed design and project management	Completed 2010
<i>Kansanshi 33kV Powerstation switchyard & line</i>	Kansan-shi Mine, Zambia	Detailed design	Completed 2010

Project Details	Client	Extent of Involvement	Status/Dates
22, 11 and 6.6kV SUBSTATIONS			
<i>Nestle Escourt : Replacement of 6,6kV Main Switchboard</i>	Nestle	Planning, Detailed design and project management	Complete 1995
<i>Umkomaas 10 MVA, 22/11kV Substation : Modification of existing</i>	Eskom Distribution	Planning proposal, Detailed design and Project management	Complete & energised 1997
<i>St Josephs 10 MVA, 22/11kV : New Substation</i>	Eskom Distribution	Planning proposal, Detailed design and Project management	Complete & energised 1996
<i>Golf Course 10 MVA, 22/11kV : New Substation</i>	Eskom Distribution	Planning proposal, Detailed design and Project management	Complete & energised 1996

Project Details	Client	Extent of Involvement	Status/Dates
22, 11 and 6.6kV SUBSTATIONS			
<i>Park Rynie 10 MVA, 22/11kV : New Substation</i>	Eskom Distribution	Planning proposal, Detailed design and Project management	Complete & energised 1996
<i>Freeland Park 5 MVA, 22/11kV : New Substation</i>	Eskom Distribution	Planning proposal, Detailed design and Project management	Complete & energised 1996
<i>Scottburgh 22kV switching station (planned for upgrade to 132/22kV substation)</i>	Eskom Distribution	Planning proposal, Detailed design and Project management	Complete & energised 1996
<i>Ellingham 22kV switching station (planned for upgrade to 22/11kV substation)</i>	Eskom Distribution	Planning proposal, Detailed design and Project management	Complete & energised 1996
<i>Pennington 10 MVA, 22/11kV : New Substation</i>	Eskom Distribution	Planning proposal, Detailed design and Project management	Complete & energised 1997
<i>Seapark 10 MVA, 22/11kV : New Substation</i>	Eskom Distribution	Planning proposal, Detailed design and Project management	Complete 1998
<i>St Lucia 5 MVA, 22/11kV : Upgrade</i>	Eskom Distribution	Planning proposal, Detailed design and Project management	Complete 2001
<i>Inyathi Rd 10 MVA, 22/11kV : New Substation</i>	Eskom Distribution	Planning proposal, Detailed design and Project management	Complete 2001
<i>Pioneer Road 11kV Switching Substation – Modifications to existing switchboard, additional protection schemes</i>	Eskom Distribution	Planning proposal, Detailed design and Project management	Complete 2001
<i>Feralloys 11kV network – replacement of all 11kV circuit breaker panels and ring main units</i>	Feralloys	Planning, Detailed design and project management	Complete 2001
<i>Estuary 10MVA, 22/11kV New substation & cable turn-ins</i>	Eskom Distribution	Planning proposal, Detailed design and Project management	Complete 2004
<i>Wesselsnek 5MVA 22/11kV Substation – establish</i>	Eskom Distribution	Planning proposal, Detailed design and Project management	Complete 2005
<i>Izotsha / Shelly Beach Protection (11kV)</i>	Eskom Distribution	Design & Project Management for installation of Current Differential with Fibre optic Link	Complete 2004
<i>Lower South Coast Directional Protection (11kV)</i>	Eskom Distribution	Design & project management of modification of protection on 6 switchboards	Complete 2003
<i>6.6kV supply for new production line – switchgear, protection, cabling</i>	Dunlop	Design & Turnkey Supply, Install & Commission	Complete 2002
<i>Phosphoric Acid Plant: Replacement of fire damaged 11kV & 3,3kV cables to substation & transformers</i>	Foscor	Turnkey Supply, Install & Commission	Complete 2006
<i>School Rd 11kV switching station – new switch house, switchgear & control plant</i>	Eskom Distribution	Design & Project management	Complete 2007
<i>Madungela 22kV line – upgrade of 75km of line to Hare & fox</i>	Eskom Distribution	Planning proposal, Detailed design and Project management	Complete 2008
<i>Maclear 22/11kV, 2x10MVA, new substation</i>	Fastmove	Detailed design	Completed 2009
<i>Fume extraction Plant : Alterations to 11kV ring & the installation of 2 x 5way Ring Main Units</i>	Assmang	Design & Project management	Completed 2010
<i>Hermannsberg 22kV line – conversion of 120km of line & 80 transformers from 11kV to 22kV</i>	Eskom Distribution	Project management	Completed 2010



EROS-ORIBI PROJECT



EROS-ORIBI 132kV
Dual Circuit Line



IDWALA 2006



Idwala-Nkonka Dual Circuit
132kV Line and Idwala 2 x
20MVA substation



Mandini 132/88/11kV Substation
Refurbishment

CVG Consulting Engineers (Pty) Ltd

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