,RONALD GRAHAM CONEY

ELECTRICAL TRANSMISSION & DISTRIBUTION CONSULTANT

Sole Proprietor GC^3 Consulting CC

QUALIFICATIONS & REGISTRATIONS

B.Sc. (Electronics & Electrical Engineering) University of Glasgow, Scotland 1973

Registered Professional Engineer (ECSA) 790126

Chartered Engineer (UK)

Fellow of South African Institute for Electrical Engineers

Fellow Institute of Engineering and Technology (UK)

South African Government Certificate of Competency (Mines & Works)

South African Government Certificate of Competency (Factories)

MDP (UNISA)

SUMMARY OF EXPERIENCE

Ron Coney is an electrical engineer with over 40 years of experience in power electrical engineering design, operations and maintenance in generation, transmission and distribution. Mr. Coney is an electrical protection specialist and has extensive experience in the definition and handling of power quality problems including the application of SMES (superconducting Magnetic Energy Storage) to mitigate voltage dip (sag) problems on a 1MW paper machine. His design and commissioning experience in substations extends to both primary and secondary plant and systems. He has managed all aspects of utility secondary plant engineering (protection, telecommunications, network control, metering & measurements and security systems). He has extensive technology strategy development experience and has developed utility based technology businesses including fixed and mobile telecommunications. He has been a board member and chairman of a number of joint venture companies associated with Eskom the South African national electricity utility. His experience of all aspects of substation design extends to 400kV AC and his experience and achievements in protection design extend to 765kV AC.

Program director for the provision of a full EPCM service for the construction of a new 400kV/220kV transmission substation including 3 * 315MVA transformers, 3 * 50Mvar 400kV shunt reactors 2/8 400kV feeders and 4/8 220kV feeders. Integration studies and full IEC 61850 substation protection and control included.

Engineering manager responsible for the EPCM services for the construction of a new 132kV/11kV stepdown substation at Phakalane and the extension of the 132kV substation at Segoditshane including a 132kV cable and 11km 132kV overhead line. Design manager for a new 220kV/132kV/66kV/33kV substation in Botswana (Orapa) , 1* 220kV 250km line, 1*132kV 160kM line, 3 * 66kV 25km lines, a 132kV/11kV substation and 2* 66kv/11kV substation including the specification of all primary and secondary plant as well as a 220kV +200-150Mvar SVC.

Specified designed and led the implementation of Eskom's change from electromagnetic protection to electronic protection for all power transmission, distribution and generation plant.

As head of electrical protection for Eskom, then the world's fifth largest electric utility, Ron; Designed, procured and commissioned Sub-Synchronous Resonance protection for the Koeberg 1000MW turbo-alternators. Designed the offsite emergency power supply scheme for Koeberg Nuclear Power Station incorporating 3 X 60 MW gas turbine generators at Acacia Power Station. Initiated Eskom's development from Phase 2 to Phase 3 (Digital) protection and integrated control systems. Initiated and drove Eskom's planned protection & control refurbishment policy and program for the transmission system.

Recent experience has included electrical protection of mining and industrial power systems and in particular the coordination and development of relay settings as well as all aspects of renewable (solar PV, CSP and wind) power plants up to 100MW and a gas engine generating plant of 100MW. Ron has investigated transformer failures, inter alia, at several South African renewable power plants and specified replacement transformers and other remedial actions with success.

RECENT EXPERIENCE

Adaptive design and detailed application for 400kV breaker and a half protection schemes and associated 132kV double busbar applications for a local utility.

Provision of expert witness inputs in respect of grid code compliance to two arbitration cases involving renewable power plants in South Africa. (Details confidential)

Technical audit, condition assessment and residual life determination for the main DC busbars at a large aluminium smelter.

Detail design reviews for infrastructure, main generation plant, balance of plant and transmission connection for the extensions to Kariba Power station in Zimbabwe

Detail design reviews for infrastructure, main generation plant, balance of plant and transmission connection for the extensions to Hwange station in Zimbabwe

Protection design review and full integrated settings study for a gas turbine power plant.

Independent Engineer for the Ressano Garcia 100MW gas fired power plant.
Appointed jointly by the owner (Gigawatt Mozambique) and the national electricity utility (EDM) to certify the mechanical and electrical completion of the power plant as well as conduct grid code compliance tests.

Factory acceptance testing of transformers, cables and switchgear up to 400kV for various projects.

Soitec, Touwsrivier CPV1, Touwsrivier, Western Cape , South Africa, Electrical Engineering Specialist. Analysis of electrical issues experienced on site and the development of design & specification solutions. Issues include the specification and direct burial of 1000V DC cables, grid code compliance transformers for inverter operation and the automation of the emergency standby power generators. Successfully gained an extension to grid code compliance exemption.

Tenke Fungurume Mining, Acid Plant 2, Fungurume, Republic of the Congo, Electrical Protection specialist. Peer review of the protection and control designs for the new acid plant including a 24MVA heat recovery steam turbine generator. Responsible for the protection coordination and development of all relay settings.

Botswana Power Corporation, Isang's Ranch Substation, Isang's Ranch, Botswana, Botswana, Design Lead. Responsible for the substation technical design through FEL-FEL4. Primary plant and secondary plant including IEC 61850 automation.

IDC, Masorini, Middleburg Mpumalanga, South Africa, Regional Director T&D, Hatch Africa. Reviewed, and as necessary provided technical input to the deliverables of the Hatch T&D staff appointed to the project. Provided high level strategy & guidance and management for the T&D team assigned to the project.

ZPC, Hwange Expansion & Kariba South Extension, Hwange & Kariba , Zimbabwe, Zimbabwe, Regional Director T&D Africa. Reviewed, and as necessary provided technical input to the deliverables of the Hatch T&D staff appointed to the project. Provided high level strategy & guidance and management for the T&D team assigned to the project.

Mainstream, Mainstream Solar - OE Support, De Aar & Droogfontein, South Africa, Sponsor. Reviewed, and as necessary provided technical input to the deliverables of the Hatch T&D staff appointed to the project. Provided high level strategy & guidance and management for the T&D team assigned to the project.

EMCOM Namibia, Transmission Masterplan, Windhoek, Namibia, Sponsor. Reviewed, and as necessary provided technical input to the deliverables of the Hatch T&D staff appointed to the project. Provided high level strategy & guidance and management for the T&D team assigned to the project.

Vestas, Chaba, Grassridge&Waainek Wind Farms, Southern Cape, South Africa, Sponsor. Reviewed, and as necessary provided technical input to the deliverables of the Hatch T&D staff appointed to the project. Provided high level strategy & guidance and management for the T&D team assigned to the project. Supervised the original FEED studies, grid connection studies and detail design for the grid connection lines and substations. Final inspection at Grassridge and issued MV Compliance Certificate.

Group Five, Kathu Solar Park, Kathu, Northwest Province, South Africa, Regional Director T&D, Hatch Africa. Reviewed, and as necessary provided technical input to the deliverables of the Hatch T&D staff appointed to the project. Provided high level strategy & guidance and management for the T&D team assigned to the project.

Kaxu, Khi & Xina CSP 50-100MW -Led the team performing grid integration and connection studies, participated in Grid Code Committee working group (IET) and motivated new sub committee to deal with grid code compliance and testing of CSP plants

Konkoonsies 1PV - Checked and authorised grid connection studies MV Certificate of Compliance and Grid connect substation final inspections and issue MV Certificate of Compliance

Konkoonsies 2 – Currently performing protection conceptual and detail design for the grid connection

Aries PV - Grid connect substation final inspections and issue MV Certificate of Compliance

Hopefield WEF - Managed the team that performed studies, conceptual design and detail design for grid connection and BOP

SCATEC - Supervised and checked grid code compliance studies

Rustmo 10MW PV - Superordinate responsibility for the design and grid code connection studies. Carried out final inspections and issued the MV Certificate of Compliance.

Dasssies KLIP WEF - Successfully took the self build project conceptual design through Eskom governance processes in an unprecedented 6 weeks.

Witkop 20MW, Soutpan 20MW, Prieska 20MW and De Aar 10MW PV Facilities - Carried out final independent design review of the entire installations and issued the Independent Grid Connection Compliance and Safety Certificates.

Botswana Power Corporation, North of Gaborone & Gaborone, Botswana, Chief Technical Officer. Isang Substation --- Full EPCM services for the construction of a new 400kV/220kV transmission substation including 3 * 315MVA transformers, 3 * 400kV shunt reactors 2/8 400kV feeders and 4/8 220kV feeders. Integration studies and full IEC 61850 protection and control included.

Phakalane & Segoditshane --- Full EPCM services for the construction of a new 132kV/11kV stepdown substation at Pkakalane and the extension of the 132kV substation at Segoditshane including a 132kV cable and 11km 132kV overhead line.

South Africa & Zambia, South Africa, Group Technical Director. • ZAMFON, Development of a 5000km Fiber Optic Cable long distance operator business for Zambia.

• Development of comprehensive technical KPIs for Eskom Transmission group

• Technology transfer and implementation of the first phase shifting transformer in Africa (100MVA, 132kV)

• Communications consolidation for Eskom Distribution’s intended roll out of mobile computing

• Local Integrated Resource Plan (LIRP) for Eskom and Municipal Distribution Authorities

• Live Work “Quantum Leap” business case for Eskom Distribution

Previous Positions and Experience

Countrywide, South Africa, Executive / General Manager EE Telecommunications. • start up and growth of Eskom Enterprises' new telecommunications businesses (R400 million pa, 50 000 lines, outsourced provider to world's 7th largest electric utility)

• Acquired 15% stake in second public telecommunications licence

• Reduced Eskom's cost of telecommunications service by R120 million pa

• Developed accelerated deployment of fiber optic cable on power lines and initiated R1 billion 7 000km installation on Eskom lines

• Acquired Tele-Com Lesotho in JV with others. (Doubled fixed line penetration to 40 000 subscribers within 2 years)

• As Eskom shareholder representative drove the successful turnaround of telecomm Lesotho

• Started up second mobile operator in Lesotho (as chairman) in May 2002 – 40 000 subscribers (gross by March 2003)

• Acquired 51% stake in a Long Distance Operator licence in Nigeria in early 2002

• Developed Eskom's positioning and strategy in respect of the third cellular licence and the emerging opportunities in public telecommunications

Countrywide, South Africa, Electrical Engineering Manager.
• Developed an integrated electrical engineering division (100 technical staff) focused on EHV transmission lines, large rotating machines and secondary control and protection plant

Countrywide, South Africa, Technology Strategy Manager - National Quality of Supply Coordinator.
• Established Eskom's first formal technology strategy and policy processes

• Managed standardization activities

• Personally led the establishment of the world's first national power quality standard

• Developed and trialed power quality mitigation solutions including the use of superconductors and other novel devices

• Developed (with others) Eskom's first integrated resource plan (IRP) and specifically led the Supply Side Options stream which investigated the feasibility of all generation options and technologies available in Southern Africa

• Led the development of policy and strategy for Eskom from coal exploitation thru generation technologies and options, Transmission , Distribution to telecommunications and IT for utilities

Countrywide, South Africa, Transmission Control Engineering Manager.
• Managed 110 technical staff in provision of cost effective design and engineering services for:

• Electrical Protection

• Measurements

• Power system control

• Telecommunications

• Security Systems

. Initiated and led the integration of protection and control systems

Countrywide, South Africa, Chief Engineer (Electrical Protection).
• Managed 37 technical
specialists accountable for protection design:

• 11kV rural to 765kV transmission lines

• Generators 5MW Diesel – 660MW PF – 1000MW Nuclear

• Personally drove the successful change from Electromechanical to electronic technology throughout all protection designs and systems

• Managed the two largest electrical protection supply contracts in the world at that time

• Engineered subsynchronous resonance protection for 1000MW Nuclear turbogenerators

Countrywide, South Africa, Senior Engineer (Electrical Protection).
• Individual contributor and leader of all small design team ± 5 Technicians. Responsible for the detailed design, specification contracting for supply, type testing, prototype commissioning, advanced field diagnostics and support for feeder, bus, transformer; generator, capacitor and reactor protection for voltages 132 - 400 kV and generators up to 600 MW (coal) - 1000 MW (nuclear). Design of auxiliary plant such as battery and charger systems was also undertaken. Significant advances in 400 kV series compensated line protection were made and subsynchronous resonance protection was successfully applied to 2 x 1000 MW nuclear turbo generators

Countrywide, South Africa, Engineer (Electrical Protection).
• Test and Commissioning of all types of electrical protection and plant associated with Generation, Transmission and Distribution of Electricity (200MW, 400 kV)

Orkney, RSA, South Africa, Assistant Engineer.
• General electrical engineering in deep level gold mining
• Specialised in large winding plant and safety testing thereof

• Commissioned a complete new electronic control system for a GEC Man Winder

CAREER HISTORY

April 2015 – Present - Independent Consulting Engineer (Sole Proprietor - GC^3 Consulting CC)

2014 -2015 Hatch Goba, Woodmead (Gauteng), South Africa. Principal Consultant T&D

2011 - 2014 Hatch Goba, Woodmead (Gauteng), South Africa. Regional Director T&D

2004 - 2011 EON Engineering, Midrand (Gauteng) , South Africa. Chief Technical Officer

2002 - 2004 ESKOM, Sandton (Gauteng), South Africa. General Manager Telecommunications

1999 - 2002 ESKOM, Sandton (Gauteng), South Africa. Executive Manager Telecommunications

1992 - 1999 ESKOM, Sandton (Gauteng), South Africa. Technology Strategy & Policy Manager

1989 - 1992 ESKOM, Sandton (Gauteng), South Africa. Transmission Control Engineering Manager

1985 - 1989 ESKOM, Sandton (Gauteng), South Africa. Chief Engineer (Head of Protection)

1980 - 1985 ESKOM, Sandton (Gauteng), South Africa. Senior Engineer Electrical Protection

1976 - 1980 ESKOM, Germiston (Transvaal), South Africa. Engineer Electrical Protection

1973 - 1976 Vaal Reefs Exploration & Mining Company, Orkney (Transvaal), South Africa. Assistant Electrical Engineer

TECHNICAL PAPERS

R G Coney, I vd Merwe, J Beukes, The Protection of Phase Shifting Transformers, 2004 Southern African Conference on Power System Protection, Midrand, South Africa, 2004

R G Coney, Keynote Address Power Quality , Power Systems World 99, Chicago (Ilinnois), United States, 1999

R.G.Coney, I.Smit, B.R.Webber & W.Buckles, The First Application of the High Efficiency Cryostat (HEC) in South Africa, PQA Southern Hemisphere, Cape Town, South Africa, 1998

R G Coney, The Cost Impacts of Poor Power Quality, PQA Southern Hemisphere, Cape Town, South Africa, 1998

R.G.Coney , G.H.Topham, The Impact of distributed generation on Protection and Power systems in South Africa., 1998 Southern African Conference on Power System Protection, Midrand, South Africa, 1998

R.G.Coney , W.J.Lubbe, B. Munanga , Projects and Developments Involving Eskom in the Southern African Region, Infrastructure development in Southern Africa Conference, Washington DC, United States, 1998

R G Coney, The Power Quality Market and Opportunities for Power Electronics, IEEE Joint PE and AI Meeting, Skukuza, South Africa, 1998

R G Coney, The Economics of Power Quality Mitigation , PQA North America 98, Phoenix (Arizona), United States, 1998

R.G.Coney*, I. Smit*, W.T. Rawlins* , K. Moodley * W. Buckles** and E. Kostecki** (* Eskom ** Superconductivity Inc.), Superconducting Magnetic Energy Storage "SMES" Application and Performance in an Industrial Voltage Dip Mitigation Application" , Cigre 3rd Southern Africa Regional Conference, Johannesburg, South Africa, 1998

R G Coney, Eskom's Premium Power Service, EA Technologies Conference, Birmingham, United Kingdom, 1997

R G Coney, The Protection of Eskom's 765kV Network, Cigré - International visit to ESKOM 's Alpha 765kV/400kV Substation, Standerton, South Africa, 1997

R.G.Coney Pr.Eng. C.Eng. R.G.Koch Pr.Eng, Eskom's Intended Use of Superconducting Magnetic Energy Storage to Mitigate the deleterious Effects of Short Time voltage Depressions on Sensitive Industrial Plant., International SMES conference , Dusseldorf, Germany, 1997

R.G.Coney, and P.A.Johnson, The Evolution from The A,B,C&D Dip Chart to the S,T,W,X,Y&Z chart in Depicting Voltage Dips In South Africa., First Southern African power Quality Conference, Durban, South Africa, 1997

R.G.Coney, T.D.J.Hennessy and R.G.Koch , A National Approach to Power Quality and the Minimization of Negative Impacts on an Economy , CIRED, Birmingham, United Kingdom, 1996

R G Coney, The Impacts of Protection Philosophy and Performance on Power System protection, 1996 Southern African Conference on Power System Protection , Midrand, South Africa, 1996

R G Coney, The Impact of Power Quality on Industry in Africa, Keynote address to Africon 1996, Stellenbosch, South Africa, 1996

R G Coney, National Power Quality Standards and Their Impacts. R.G.Coney , Power Systems World Conference 96 (Power Value Track), Las Vegas, United States, 1996

R G Coney, The Application of Superconducting Storage Devices to mitigate power quality problems in South Africa, Keynote address to the first annual Utility SMES Users Association Meeting, Chicago, United States, 1996

R.G.Coney, S.J.Lennon, J.W.Gosling, D.F.Hunt, A Proposal for a Southern African Electricity Association, UPDEA Conference in Algiers , Algiers, Algeria, 1996

R.G.Coney, R.G.Koch, I.Smit, W.T.Rawlins, Harmonics an Issue of Electromagnetic Compatibilty, SAIEE Tutorial on E.M.C., Johannesburg, South Africa, 1995

R.G.Coney, I Smit, Voltage Dips, Eskom Technology Transfer Conference on Quality of Supply, Durban, South Africa, 1995

R.G.Coney,G.H.Topham, H.J.Vogel, J.M.Theunissen, Refurbishment of Protection, Cigré Bi-annual meeting, Paris, France, 1992

E.F. Raynham, R G Coney, D H Cretchley, W J Meintjies., Transmission and Distribution Technologies, National Energy Council & Eskom. Seminar on "Issues affecting future electricity strategies for South Africa". Pretoria, Pretoria, South Africa, 1990

R G Coney (author) - Presented by R G Mwansa, Eskom's Auto Reclosing Philosophies, Cigré Bi-annual meeting, Paris, France, 1990

R G Coney, G J Coetzee, H Rademan, The Integration of Eskom's Matimba Power Plant., 11 Sepope, Sao Paulo, Brazil, 1989

R G Coney, G H Topham and M G Fawkes., Experience and problems with the protection of series compensated lines, IEE Fourth International conference on developments in Power System Protection , Edinburgh, United Kingdom, 1989

R G Coney, G H. Topham and P M Marot., Over and under voltage protection of a weakly interconnected long line systems, IEE Fourth International Conference on Developments in Power System Protection , Edinburgh, United Kingdom, 1989

R G Coney, The Protection of aerial bundled conductors., Joint SAIEE/SABS Workshop on Electrification., Pretoria, South Africa, 1989

R G Coney, K J Mackay, A van der Walt., Current Transformers and Basic Protection, Association of Municipal and Electrical Undertakings - Annual Regional Conference, Bloemfontein (OFS), South Africa, 1989

R G Coney, Electronics in Protection, South African Institute of Electrical Engineers, Johannesburg, South Africa, 1987

R G Coney, The Protection of Eskom's Alpha and Beta 400/765kv substations, Cigré - open conference on transmission systems , Johannesburg, South Africa, 1987

R G Coney, Current Transformers for Protection, Association of Municipal and Electrical Undertakings - Annual Regional Conference, Parys (Orange Free State), South Africa, 1986

R G Coney, The protection application policies of the electricity supply commission of South Africa., IEE Third international conference on developments in power system protection., London, United Kingdom, 1985

R G Coney, The Impacts of Protection Philosophy and Performance on Power System protection, 1996 Southern African Conference on Power System Protection , Midrand, South Africa, 1996

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R.G.Coney, R.G.Koch, I.Smit, W.T.Rawlins, Harmonics an Issue of Electromagnetic Compatibilty, SAIEE Tutorial on E.M.C., Johannesburg, South Africa, 1995

R.G.Coney, I Smit, Voltage Dips, Eskom Technology Transfer Conference on Quality of Supply, Durban, South Africa, 1995

R.G.Coney,G.H.Topham, H.J.Vogel, J.M.Theunissen, Refurbishment of Protection, Cigré Bi-annual meeting, Paris, France, 1992

E.F. Raynham, R G Coney, D H Cretchley, W J Meintjies., Transmission and Distribution Technologies, National Energy Council & Eskom. Seminar on “Issues affecting future electricity strategies for South Africa”. Pretoria, Pretoria, South Africa, 1990

R G Coney (author) - Presented by R G Mwansa, Eskom’s Auto Reclosing Philosophies, Cigré Bi-annual meeting, Paris, France, 1990

R G Coney, G J Coetzee, H Rademan, The Integration of Eskom’s Matimba Power Plant., 11 Sepope, Sao Paulo, Brazil, 1989

R G Coney, G H Topham and M G Fawkes., Experience and problems with the protection of series compensated lines, IEE Fourth International conference on developments in Power System Protection , Edinburgh, United Kingdom, 1989

R G Coney, G H. Topham and P M Marot., Over and under voltage protection of a weakly interconnected long line systems, IEE Fourth International Conference on Developments in Power System Protection , Edinburgh, United Kingdom, 1989

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R G Coney, Current Transformers for Protection, Association of Municipal and Electrical

Undertakings - Annual Regional Conference, Parys (Orange Free State), South Africa, 1986

R G Coney, The protection application policies of the electricity supply commission of South Africa., IEE Third international conference on developments in power system protection., London, United Kingdom, 1985

LANGUAGES

English -Fluent and proficient
Afrikaans – Working ability