



# Authors

## Chapter 1: Design and manufacture of transformers



### Henry du Preez

Henry du Preez is an independent consultant with over 52 years experience since graduating at the University of the Witwatersrand. Specialising in electrical machines (both ac and dc) and transformers, he has extensive experience in mining and industry and offers a range of specialised training courses in association with 'Specialized Knowledge and ABB (Transformers)'. Henry has travelled to many countries – including the UK, India, China, USA, Oman - consulting, analysing faults and witnessing tests of machines and transformers. He has also consulted in Africa, including the DRC (Inga power station and copper mines for machines and transformers).

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### Sidwell Mtetwa

Nkosenye Sidwell Mtetwa (Pr Eng) is currently employed at Eskom Holdings SOC, as a Corporate Specialist for Power Transformers and Reactors. He holds an MSc degree in Power Engineering from the University of Witwatersrand. He has 11 years of experience in power transformers and is professionally registered with ECSA and SAIEE. Sidwell currently serves as chairman of the South African A2 study committee for Cigré and served on the working groups of the same engineering body. In Eskom, he is the chairman of the Steering Committee of Technology (SCOT) Transformer Care Group.

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### Evert Swanepoel

Evert Swanepoel is Centre Director for the Copper Development Association Africa (CDAA) - responsible for promoting and expanding the use of copper in Africa. His vast experience in managing large businesses has provided him with the skill and knowledge to promote copper projects that are positioned to increase the demand and utilisation of this ductile metal throughout Africa. He aims to expand CDAA membership throughout the continent to include the complete spectrum of the copper industry, from primary through to downstream companies and service organisations.

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### Carel Carelsen

Carel Carelsen joined Asea Electric (now Powertech) in April 1982. The first position he held was Non Destructive Testing Technician, which involved X-rays, ultrasonic testing, etc. His experience includes winding assembly and winding manufacture. His current position is Development and Support Manager (Mechanical).

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### Mluleki Hlatshwayo

Mluleki Hlatshwayo has completed a BSc degree in Electrical Engineering from the University of KwaZulu-Natal and an MSc degree in Electrical Engineering from the University of the Witwatersrand. He is registered as a professional engineer with ECSA. He is currently the Development and Support Manager in the Electrical section of the Group Technology Department at Powertech Transformers. Mluleki worked as an electrical engineer and researcher responsible for development work of leakage flux problems, load losses and hot-spots evaluation in structural parts of power transformers. He joined the company in 2009 as an engineer-in-training. He also chairs the Electrical Equipment Testing and Research subcommittee of the SAIEE's Power and Energy Section.

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### Gareth Stanford

Gareth Stanford holds a BSc in Electrical Engineering, a Graduate Diploma in Electrical Engineering and a Masters of Science in Engineering – all from the University of the Witwatersrand. He joined Eskom in 1997 as an Electrical Engineer-in-Training. Rising up the ranks, in 2007 he became Chief Electrical Engineer in Eskom's Industry Association Resource Centre (overhead lines and distribution auxiliary equipment). In 2008, he joined Desta Power Matla as Technology Manager. In 2010, he moved to Powertech Transformers Technology Development and Support as Small and Medium Distribution Transformers manager.

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### Johan Haarhoff

Johan Haarhoff joined IST (now Powertech SI) in March 2006 as a CFD specialist, after part time lecturing and CFD consulting on gas cleaning systems at the University of Pretoria. In 2009, Johan joined Powertech Transformers as Senior Engineer, working on simulations and optimisation, and is currently running the Mechanical Research and Design Optimisation group, focusing on FEM and CFD simulations, as well as optimisation.

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## Chapter 2: Design and installation of a substation



**Paulo De Matos**

Paulo De Matos has an NHD in Electrical Engineering. He held the position of Senior Technician (flameproof switchgear) at Fermlec for eight years; he was Project Manager (signal systems) at ATM for four years; and he worked as a Technical Manager (Transformer Equipment) at Galbro. He

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**Warwick Jackson**

Warwick Jackson BSc (Hon) Electrical Engineering, returned to South Africa at the end of 2006 after working for GHD Ltd Brisbane, Australia, where he held the position of Senior Electrical Engineer for power delivery. His career began with Eskom (South Africa) in 1997 where he worked

in the protection and setting section of the Pretoria Power Distributor. In 2001, he joined Thales Communication in the UK before going to Brisbane in 2005. He worked for Anglo - Kumba for just over seven years, having worked as Engineering Manager for the Anglo American Kumba Iron Ore Sishen Ramp Up Project, the Sishen Expansion Project as well as having held the position of Lead Electrical Engineer for the Kolomela mine project. He is currently the Managing Director of Efficient Power.

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**Gilson Semiano**

Gilson Semiano was born in Taió, Brazil, in 1980. He received a BSc in Electrical Engineering from the University of Blumenau, Brazil. He is a Design Engineer of WEG Electric Corporation. His research interests include power electronics, modelling and simulation of power systems and

power transformers.

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**Roger Billiet**

Roger Billiet obtained a degree in Electrical Engineering in his home country, Belgium – and worked for the Belgian Electricity Board for six years. He immigrated to South Africa in 1982, studied through UNISA and worked in various organisations. He is currently employed by NTSA

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**Alexis Barwise**

Alexis Barwise holds a BEng (Electrical and Electronic) from North-West University in South Africa. He is the Managing Director of DEHN Protection SA. Prior to joining the company, he was the Key Vertical Accounts Manager for IT Business in southern Africa at Schneider Electric South Africa.

His experience in electrical design engineering, systems engineering, and management has provided him with the skill and knowledge to promote the use of DEHN's products throughout the continent.

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**Jean-Noël Bérubé**

Jean-Noël Bérubé is a Global Fibre Optic Product Specialist at Neoptix, a division of Qualitrol Company LLC. A founding member of Neoptix, he is heavily involved in the design and application of fibre optic temperature probes used for hot-spot temperature monitoring in power transformers. Bérubé travels worldwide to train transformer manufacturers on how best to install and use fibre optic probes. An electrical engineer and IEEE member with more than 40 years' experience, his field of expertise is in instrument design and application where optic, electronics and software are applied together.

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**Jacques Aubin**

Jacques Aubin is a transformer consultant especially active in the field of thermal behaviour and insulation ageing. He was, until recently, with GE Energy in Montreal where he was mainly involved in development and testing of advance-monitoring systems for power transformers. Until 1998, Jacques was with Hydro-Quebec in Canada where he directed research activities related to overloading, short-circuit strength and acceptance tests on power transformers. Jacques graduated in 1962 from École Polytechnique de Montréal.

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**Bill McDermid**

Bill McDermid graduated from the University of Manitoba with a BSc in Electrical Engineering. Since 1962, he has been working with Manitoba Hydro where he is involved in the diagnostic testing of electrical insulation applied to all types of apparatus. He has, for many years, been a technical advisor on a number of CEA research projects related to on-line partial discharge measurements. Bill was honoured with the 2009 IEEE Canada Power Engineering Award for his contributions to the development of diagnostic test methods for the insulation systems of rotating machines. Bill's innovations in the field have been adopted as industry standards and have contributed to the enhanced reliability of electric power generation.

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### Chapter 3: Substation automation



#### Tim Craven

Tim Craven joined H3iSquared in 2008 in a technical support role and has been with the company since then, providing technical support, network auditing and training to leaders in the industrial, utility and ITS industries.

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#### Martin Sanne

Martin Christian Sanne completed a BSc in Electrical Engineering at the University of the Witwatersrand and an MSc in Digital Systems at Cranfield, England. Martin is a registered Professional Engineer in South Africa and started his career in various roles in R&D in Germany, including heading up the Engineering Division at Siemens Telecommunications in South Africa in the 1990s.

As General Manager of SEACOM SA and Global Head of Sales of SEACOM, Mauritius, Martin helped SEACOM to build its operational and sales business across Africa and internationally. Prior to joining SEACOM, Martin headed up Mobile Network sales of Nokia Siemens Networks as Sales Director and Divisional Managing Director in Southern Africa.

A significant part of Martin's career was with Siemens AG in Germany where he headed up the line of business for 3G and helped place Siemens on the map amongst the top three 3G equipment vendors of the world. Since October 2012, Martin's role has been that of Divisional Cluster Lead for Smart Grid in Africa.

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#### Vincent Thornley

Vincent Thornley has more than 20 years' experience in the power industry across a variety of roles, including manufacturing, academia, consultancy, technology development and project delivery. This experience covers many technological fields, including nuclear generation, power system

protection and control, integration of renewable energy (PV, wind, hydro, landfill gas) and smart grid technologies. Vincent is Portfolio and Technology Manager in the Siemens Smart Grid division, where he is responsible for the energy automation product and solution portfolio. A key aspect of his work is guiding Siemens technology development to meet the business change needs for low carbon energy systems and flexible networks. He is a chartered engineer (CEng) and a Member of the Institution of Engineering and Technology (MIET).

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### Chapter 4: Maintenance



#### Sishal Kuwar-Kanaye

Sishal Kuwar-Kanaye, currently Group Project Engineer at Impact Energy, has spent more than 17 years in HV project, commissioning and maintenance environments. His early years at Eskom's Majuba Power Station involved commissioning and maintenance of protection and measurement

systems. Twelve years at Richards Bay Minerals enabled a deeper understanding of protection systems, metering and billing, power quality, energy and project management. Sishal holds a BTech Elec degree, a Masters Certificate in Project Management (GWCPM), Certified Energy Manager (CEM), Certified Measurements and Verification Professional (CMVP) and he is registered with ECSA. He has set his current and future career aspirations as a catalyst and an enabler for a new era in PQ with the support of Elspec technology and product range.

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#### Neil Robinson

Neil Robinson is Managing Director of the WearCheck division of the Set Point group. He holds a BSc (Applied Chemistry) from De Montfort University, in the UK. After joining WearCheck in 1997 as laboratory chemist at the Durban laboratory, Neil was appointed Managing Director in

2005. With more than 17 years' experience in the oil analysis and condition monitoring industry, he has focused on expanding the network of the WearCheck laboratories and condition monitoring services on the African continent and beyond, with an active involvement in introducing the latest reliability solutions and laboratory technology to address the ever-evolving maintenance needs of heavy industry.

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#### Hugh Hoagland

Hugh Hoagland is among the foremost experts on electrical arc testing and safety. His career began with safety testing at LG&E Energy. Later, he worked as R&D Director for NASCO, manufacturer of protective outerwear solutions. He has been involved in the development of most of the

arc-resistant rainwear used today and for the first face shield to protect against electric arcs. He assisted Cintas to develop a strategy for meeting the needs of OSHA 1910.269 and NFPA70E standards, before moving to full-time training and consulting.

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Zarheer Jooma is a professionally registered electrical engineer with ECSA and a senior member of the South African Institute of Electrical Engineers. Zarheer is the Director of the South African branch of the US-based company, e-Hazard. The company consults to garment manufacturers, performs arc flash calculations and electrical safety consulting work. e-Hazard offers NFPA-accredited electrical arc flash training, and garment testing/ SANS compliance.

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**Johann De Bruto**

Johann De Bruto was employed as Electrical Design Engineer by ABB Powertech from 1984 to 1995. He joined Hawker Siddeley Transformers as Engineering Manager until 1999 and then held the same position at NEI Transformers until he became Group Technology Manager at Desta Power Matla in 2004. He was Director at Free State Transformers from 2007. He is currently works for Saftronics.

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