

**Rob Stephen**
South Africa

Dr. Rob Stephen was born in Johannesburg South Africa. He graduated from the University of the Witwatersrand in 1979 with a BSc Electrical Engineering degree. He joined Eskom the electrical utility in 1980. He holds both MSc, MBA degrees as well as a PhD in overhead line design. He is currently the Master Specialist in the Technology Group in Eskom and is responsible for distribution and transmission technologies of all voltages covering both AC and DC and was responsible for the smart grid strategy for Eskom. He is past chairman of Cigre SC B2 on overhead lines, and has held positions in Cigre of Special reporter and working group chairman and has authored over 100 technical papers. He was elected International President of Cigre in 2016. He is also a Fellow of the South African Institute of Electrical Engineers (SAIEE) and was elected Honorary Vice President in 2005. He received the SAIEE President's award in 2016. He is presently the Editor-in-Chief of the CIGRE Science & Engineering Journal.

Membership Professional Societies / Institutions

- Registered Professional Engineer 1984
- Fellow of South African Institute of Electrical Engineers (SAIEE)
- Member of Council of the SAIEE (South African Institute of Electrical Engineers) 1995-1998
- Chairman of Power Section of SAIEE 1993
- Chairman KZN Centre of SAIEE 1999
- Chairman of Cigre International working Group 12 of Study Committee 22 entitled Electrical aspects of overhead lines 1989-2000
- Special reporter adjudicating papers for International Paris meeting in 1996 and 2014 for SC22.
- Chairman for SC22 (overhead lines) Cigre from 2000 – 2004
- Honorary life Member of Cigre 2004
- Honorary Vice President of the SAIEE 2005
- Member KZN Centre of SAIEE
- Received Lifetime Achievement Award SAIEE 2008.
- Chairman of Working Group B2-51 Cigre 2010-2015
- Chairman Cigre working group B2-63 Cigre 2015- present
- Member of Cigre Steering committee.
- President Cigre 2016-2020

Education

- MBA University of the Witwatersrand Business School 1993
- MSc University of Natal 1988
- Government Certificate of Competency (electrical) 1984
- MBA University of the Witwatersrand Business School 1993
- MSc University of Natal 1988
- Government Certificate of Competency (electrical) 1984
- BSc (Electrical Engineering) University of Witwatersrand 1979
- PhD (Electrical Engineering) at University of Cape Town 2011

External Examiner/ Industrial mentor

MSc and PhD candidates for various subjects for University of Stellenbosch and University of University of Kwa Zulu Natal.

Employment record**2016-2020**

Appointed President of CIGRE at CIGRE Paris session 2016. Responsible for all activities and direction of CIGRE worldwide. Continue to work as Master Specialist in Technology Group, Eskom.

2011-present

Appointed as Master Specialist in Technology group responsible for wires technologies for all voltages for AC and DC transmission. This includes directing technical strategies such as smart grid, technology, metering, lines etc. Reviewing certain designs, input into technical decisions and approval of concepts. Responsible for technical governance in Eskom for formation and adherence to technical standards, strategies and procedures. Authored two chapters in CIGRE Green Book on overhead lines. Chaired SANS 10280 committee on overhead line design.

2006-2011

Appointed as General Manager Capital Programme in Distribution Division. Responsible for creation of Distribution network assets from Planning to commissioning. Responsible for capital expansion approximately R8bn-10bn per year as well as Electrification (as part of Government programme). Allocates capital funds to Regions based on unit cost analysis as well as other effectiveness measures.

Strategic planning for electrification programme.

Review and approval of Transmission line designs

2004-2006

Appointed as Corporate consultant Power delivery in the Capital Engineering Department of Enterprises division. Involved in :

- review of network plans above R50m for Distribution
- Audits of Transmission designs and practices
- Review of Transmission line designs
- Acting substation manager
- Strategic planning for electrification programme (up to 570000 connections per annum).
- Design of HVDC solutions relating to converting lines from AC to DC and establishing DC links in Africa.

2002- 2004

Appointed as Corporate Consultant in the Eskom Enterprises Company, a subsidiary of Eskom Holdings (previously Eskom). Work to date has included inter alia:-

- Involved with Independent Power Producer studies in Libya and Saudi Arabia.
- Review of Planning proposals in Northern Region
- Review of Transmission line designs for Transmission Group.
- Review of insulator specifications.Compilation of the Distribution Capital plan including analysis and development of target costs for electrification.
- Bid leader on the Ugandan Distribution Concession.
- Development of a Research Roadmap for Distribution.
- Development of a strategic plan for retaining and optimising engineering skills in Distribution.
- Author of chapter on thermal rating of lines for overhead lines book.

1995-2002

Joined Distribution Technology to resolve national issues in the system planning environment. This included processes, training, techniques etc. I was appointed as Corporate Consultant Distribution Expansion Planning in the Distribution Technology group.

I expanded on this task to develop the Capital Investment Process (later to become the Network Asset Creation value chain process).

I was then involved with the reduction of cost per connection for the electrification programme. I developed indicators and methods whereby the costs could be reduced. The results were that the cost reduced in real terms by more than 50% from 1995 to 2000. This has resulted in a productivity award being given to Eskom in 1997 and an application and gold award being received in 2002. The amount saved was in the Region of R400-R600m per year.

The methods were extended to the reticulation environment where indicators were used to target costs per transformer. This reduced the costs by an average of R60m per year.

I was involved in a number of issues mainly involving capital allocation in Distribution. I was the Network Asset Creation Value chain champion for Distribution.

I represented Distribution at the capital investment committee at Management Board level (MBCIC) as well as the Transmission Investment Committee.

International recognition was given when I received the Cigre Technical Committee award in 1997.

I was elected as special reporter for the 1996 Session in Paris in recognition as a specialist.

In 2000 I was elected Chairman of Study Committee 22 the Study Committee on overhead lines. This is a first for South Africa.

I was asked by Transgrid in Australia to consult to them on thermal rating of lines in 2000.

Consulted to the World Bank in electrification in Uganda in 2000.

1989-1995

Due to work on thermal rating as well as recognition as expert in design, I was offered a Chief engineers post to head the line design department in Transmission. Responsible for civil, mechanical and electrical aspects of Transmission line design.

Promoted to E band (senior management) in 1992 responsible for the line design and project engineering section of Transmission lines.

Through my efforts line costs were reduced 30% by implementing probabilistic design methods, innovative design techniques as well as a line design and optimisation process that could objectively determine the best design option to follow. An example of this was the development and introduction of the Cross rope suspension tower first used on the Camden Duhva 400kV line. Line savings of over R30m realised in this line alone.

The MBA was completed in 1993. The organisational behaviour studies enabled a reengineering of the department and to realise a learning organisation system of operation of the unit.

International recognition was given in that I became chairman of the international Working Group on electrical aspects of lines within CIGRE.

1986-1989

Senior Engineer and then Deputy Engineering Manager, Western Natal Region. Initially head of planning and design then head of Planning, design, construction, survey, drawing office, and maintenance sections. Staff complement over 600.

On a national level I was chairman of both the planning and design Special Interest Groups dealing with issues at this level.

In 1988 I was elected as member of the international working group in Cigre (International conference on high voltage systems) dealing with thermal rating of lines.

Completed my MSc thesis in 1988 dealing with thermal rating of lines.

1984-1986

Selected to go to Japan for 1 year intensive study of the 765kV reactors, transformers, and switchgear. Worked in Toshiba Hamakawasaki works for 12 months as well as Fuji Works in Chiba. On return posted as resident engineer on site at Beta 765kV/400kV substation. Station was commissioned successfully ahead of schedule. This was the first of its kind in the world.

Obtained registration as Professional. Engineer and Government Certificate of Competency in 1984 in order to fulfil roles on site.

1982-1984

Moved to Natal Region as Planning engineer at subtransmission level. Responsible to subtransmission planning in Natal Region.

1981-1982

Joined Eskom Distribution Protection as Engineer in training in Witbank. Involved in protection setting of LZ32 relay and other related projects.

1980-1981

Sub Lieutenant SA Navy (National Service). Designed analogue electronic regulators for Replenishment vessels and Frigates.

1975-1979

Eskom Bursar



Pouyan Pourbeik
USA

Pouyan Pourbeik has served the electric power and energy industry as a consultant and a researcher since 1997. He completed his Bachelor of Electrical and Electronic Engineering and PhD in Electrical Engineering in 1993 and 1997, respectively, at the University of Adelaide, Australia. He worked for GE Power Systems Energy Consulting from 1997 to 2000. From 2000 to 2006 he was with ABB Inc. in the Electric Systems Consulting group. From 2006 to 2016 he worked for the Electric Power Research Institute. In March 2016, Dr. Pourbeik founded Power and Energy, Analysis, Consulting and Education, PLLC.

Throughout his career Dr. Pourbeik has led and performed numerous consulting and research projects spanning a wide range of electric power system technical performance issues. He has also extensively performed generator model validation and field testing in North America and overseas for both synchronous and inverterbased generation systems. He has led and performed studies related to power flow analysis, transient and smallsignal stability analysis, voltage

stability analysis, modeling and model validation of generation and transmission equipment, integration of renewable energy systems, subsynchronous resonance and torsional interaction issues, application of FACTS and HVDC, electromagnetic transients associated with line/cable switching, shunt capacitor switching and shunt and series reactor switching, overvoltage protection of series capacitors, and many other aspects of power systems technical performance. He has been, and continues to be, a major technical contributor to the development of numerous dynamic models that are presently standard library models in the most popular commercial power system planning software tools, including models for wind and photovoltaic generation, battery energy storage, HVDC systems, SVC and STATCOMs, dynamic load models, turbine-governor models for gas turbines and combined-cycle power plants, and several other models associated with conventional synchronous generators. He is also the developer of model validation tools and techniques, which are used by numerous utilities, independent system operators and other power authorities in North America and outside of the US.

Dr. Pourbeik has authored or co-authored over ninety technical publications, including one text book on smallsignal stability analysis of power systems, which has been released as an e-book and downloaded by thousands of readers worldwide. He has also given workshops, taught short-courses, and provided training sessions for numerous utilities and utility engineers around the world in Europe, North America and Africa.

Dr. Pourbeik is a Fellow of the IEEE, an Honorary and Distinguished Member of CIGRE and a license professional engineer in the States of North Carolina and Texas. He is also a past chairman of both the IEEE Power & Energy Society's Power System Dynamic Performance Committee and the CIGRE Study Committee C4 – System Technical Performance. He has also been an active member and/or led numerous international task forces and Working Groups within IEEE, CIGRE, NERC, WECC and IEC.

Education

BE in Electrical and Electronic Engineering, University of Adelaide, AUSTRALIA
PhD in Electrical Engineering, University of Adelaide, AUSTRALIA

Professional activities

- Licensed Professional Engineer in the States of Texas and North Carolina
- Fellow of the IEEE
- Honorary and Distinguished member of CIGRE
- Past Chairman of the IEEE Power & Energy Society (PES), Power System Dynamic Performance Committee
- Past Chairman of the CIGRE Study Committee C4 – System Technical Performance
- Past Chairman of the IEEE PES Dynamic Performance of Renewable Energy Systems Working Group
- Chairman of the WECC HVDC Task Force
- Member of the WECC Modeling and Validation Working Group
- Member of the WECC Modeling and Validation Working Group Steering Committee
- Member of the WECC Renewable Energy Modeling Task Force
- Member of the NERC Plant-Level Controls and Protection Modeling Task Force
- Member of the NERC Power Plant Modeling and Verification Task Force
- Member of the NERC Load Modeling Task Force
- Member of the NERC Inverter-Based Resource Performance Task Force
- Member of the NERC System Planning Impacts of DER Task Force
- Member of the IEEE Standard P2800 WG on Performance Standards for Inverter Based Generation

Awards

- WECC Outstanding Contribution Award, September 2015
- CIGRE USNC Philip Sporn Award 2018
- CIGRE Honorary Member Award 2016
- CIGRE USNC Attwood Associates Award 2011
- CIGRE Distinguished Member Award 2008
- CIGRE Technical Committee Award 2006
- IEEE PES Technical Council Distinguished Service Award 2016
- IEEE PES Technical Committee Distinguished Individual Service Award 2016
- IEEE Working Group and Paper Awards (several) 2000, 2008, 2009, 2010, 2011, 2014, 2015, 2018, 2019

Publications

Dr. Pourbeik has over 90 technical publications in journals, conferences, international task force documents, and one text book.



Editorial Board



Nikos Hatziaargyriou
Greece

Nikos D. Hatziaargyriou received the Diploma in Electrical and Mechanical Engineering from NTUA (National Technical University of Athens) in 1976 and the MSC and PhD degrees in Electrical Power Engineering from UMIST, Manchester, in 1979 and 1982, respectively.

Since 1984 he is with the Power Division of the Electrical and Computer Engineering Department of NTUA and since 1995, he is full professor in Power Systems. He is Director of the Energy Systems Laboratory of the National Technical University of Athens and founder of the “SmartRue” research unit.

From April 2015 to May 2018 was Chairman and CEO of the Hellenic Distribution Network Operator (HEDNO), the Distribution Utility of Greece, while from April 2015 until now he is Chairman of the Board.

From February 2007 until September 2012 he was Deputy CEO of the Public Power Corporation (PPC), the national Utility in Greece, responsible

for the Transmission and Distribution Divisions, island DNO (Distribution Network Operation) and the Center of Testing, Research and Prototyping. He was Chair of PPC Telecommunications and Vice-Chair of PPC Renewables from June 2007 to Feb 2010.

He is Fellow Member of the Institute of Electrical and Electronics Engineers (IEEE), past Chair of the Power System Dynamic Performance (PSDP) Committee, honorary member of CIGRE, chair of the strategic CIGRE WG “Networks of the Future” and past Chair of CIGRE SC C6 “Distribution Systems and Distributed Generation”. He is Editor in Chief of the IEEE Trans on Power Systems. He is chair of the European Technology and Innovation Platform for Smart Networks for Energy Transition and former chair of the European Technology Platform on SmartGrids.

He has participated in more than 60 R&DD Projects funded by the EC and the industry, and has coordinated among others the EC “CARE”, “MORE CARE”, “MERGE”, “Microgrids” and “More Microgrids” projects.

He is author of the book “Microgrids: Architectures and Control” and of more than 250 journal publications and 600 conference proceedings papers. He is included in the 2016 and 2017 Thomson Reuters’ list of the top 1% most cited researchers in any field and discipline.



Erli Figueiredo
Brazil

Erli F. Figueiredo received his master degree from the Rensselaer Polytechnic Institute (RPI), Troy, New York, and his doctorate degree from Rio de Janeiro Federal University. He was Head of Transmission and Generation System Studies Division from 1977 to 1990 at Furnas Centrais Elétricas, a Brazilian Electric Power Company. Since 1995 he has been lecturing at Rio de Janeiro State University, and was head of the Electrical Engineering Department in 1998-2000 and 2006-2008. From 1996 to 1999 he was Technical Chairman of the Brazilian National Seminary on Production and Transmission of Electrical Energy. From 1998 to 2004 he was member of CIGRE Study Committee “Rotating Electrical Machines” (SC A1). From 2004 to 2008 he was the Brazilian representative of CIGRE in SC A1, and from 2008 to 2014 Chairman of SC A1. He was Distinguished Member of CIGRE in 2012 and Honorary Member of CIGRE in 2014. He has authored/co-authored numerous papers, CIGRE technical brochures and reports. At present, he is the Convener of CIGRE Motors Advisory Group and Convener of CIGRE Working Group “Guide for Evaluating the Repair/Replacement of Standard Efficiency Motors”.



Christian Franck
Switzerland

Christian M. Franck studied physics at the universities of Bonn (Germany), Edinburgh (Scotland) and Kiel (Germany) and received a diploma in physics from the University of Kiel, Germany in 1999. He worked as a scientific assistant at the Max-Planck-Institute for Plasma Physics and received the Ph.D. degree in experimental physics from the University of Greifswald, Germany in 2003. He was with the Swiss corporate research center of ABB during 2003-2009 as a Scientist and Group Leader for gas circuit breakers and high voltage systems. Currently, he is Associate Professor for High Voltage Technology at the Swiss Federal Institute of Technology (ETH), Zurich, Switzerland. His main research interests are in the area of gaseous insulation systems and equipment for HVDC.

He was convenor of the JWG A3/B4.34 (DC switching equipment) and currently convenes D1.67 (Dielectric performance of new non-SF6 gas mixtures).

Degrees/Higher Education

2003 PhD, Experimental Physics, University of Greifswald (Germany)
2004 Diploma, Economics (Diplom Wirtschaftsphysiker), Fernuniversität Hagen (Germany)
1999 Diploma, Physics, University of Kiel (Germany)

Professional Career

2015 - present Associate Professor at ETH Zurich
2010-2015 Assistant Professor (tenure track) at ETH Zurich
2003 - 2009 Scientist and Group Leader, ABB Corporate Research Centre, Baden (Switzerland)



Xidong Liang
China

Xidong Liang received his BSc, MSc and PhD degree in 1984, 1987 and 1991 respectively from Tsinghua University, China all in Electrical Engineering. He was the visiting scholar at UMIST, UK, 1991-1992. He is the professor of high voltage in the department of Electrical Engineering, Tsinghua University since 1997, and was the Dean of this department, 2001-2007. He is the Director of State Key Laboratory of Power System, Tsinghua University since 2005. From October 2009 to July 2013 he was the President of Qinghai University, China. He received the honour of “Distinguished Young Scientists” from China National Natural Science Funds in 2000, “Claude de Turreil Memorial Award” from INMR in 2009, and the Distinguished Member of CIGRE in 2012. He is the vice chairman of the board of directors of China Electro-technical Society since 2015 and Executive Member of Chinese Society on Electrical Engineering since 2006. He was the Member of SC 33 (2000-2002), SC B2 (2006-2012) and now the Member of SC D1 since 2016.



Susana Almeida de Graaff
Netherlands

Susana Almeida de Graaff has dedicated her professional life to power system operations.

She received her Licenciatura (5 years degree), M.Sc and PhD degrees in Electrical Engineering from Porto University, Portugal, respectively in 2000, 2006 and 2010. Her PhD work "Portuguese Transmission Grid Incidents - Risk Assessment" was approved with distinction.

She was with REN, the Portuguese TSO, since the beginning of 2001, with System Operations in the development of activities such as network security analysis, online risk assessment and disturbance/blackout analysis.

Since November 2010, she is with TenneT TSO B.V. in the Netherlands, in International Development within System Operations, focusing in innovation, research and development, cooperation and coordination among TSOs, developing methodologies for capacity calculation, network security on a European level, including R&D projects.

Dr. Susana Almeida de Graaff is the Chair of CIGRE Study Committee C2 on System Operations and Control since August 2016, and contributing actively to CIGRE SC C2 activities since 2006, as Working Group Member, Special Reporter and National Member.

Awards

2018 (December) - Hidde Nijland Prize in the Netherlands, in recognition for contributions to the development of the electrical power system

2013 - CIGRE Technical Committee Award, in recognition of contribution to the Study Committee C2

2005 - REN prize with her M.Sc. thesis in electrical power systems