



# Blaze Avenue

Empowering Business Ideas

---

## POWER SYSTEM PROTECTION

---

3 DAYS WORKSHOP  
3rd -5th OCTOBER 2017  
Dar Es Salaam  
Golden Tulip Hotel Tanzania

Dr. Bikash Pal  
COURSE INSTRUCTOR

---

Limited Seats Only



# Blaze Avenue

Empowering Business Ideas

## Our Past Clients

- Kenya Power & Lighting Co. Ltd - Kenya
- PT Bekasi Power - Indonesia
- PT Perusahaan Listrik Negara (PLN) - Indonesia
- Sarawak Energy Berhad - Malaysia
- Hong Kong Electric Company - Hong Kong
- National Electric Power Regulatory Authority (NEPRA) - Pakistan
- Saudi Electricity Company - Saudi Arabia
- National Grid Cooperation Philippines (NGCP) - Phillipines
- Emirates SembCorp Water & Power Company - UAE
- Tenaga Nasional Berhad (TNB) - Malaysia
- DNV GL Private Limited - Singapore
- Ceylon Electricity Board (CEB) - Sri Lanka
- Sabah Electricity - Malaysia
- Lanka Electricity Company (Pvt) Ltd - Sri Lanka
- NamPower Corporation (Proprietary) Ltd - Namibia
- Kenya Generation (Kengen) - Kenya
- Transmission Company of Nigeria (TCN) - Nigeria
- Niger Delta Power Holding Company Limited (NDPHC) - Nigeria

## In House Training Solutions :

We provide training and development programs tailored to the needs of your organization. We pay attention to the course contents as well as enhanced delivery methods to ensure that your employees learning are transferred to the workplace.

Get in touch:



# Blaze Avenue

Empowering Business Ideas

## Our Power Sector Training List (Partial List)

- Smart Grids - Platform of the Smart Cities
- Power System Stability & Control
- Renewable Resources : From Planning To Operations
- PLC, SCADA and AC Drives for Industry
- SCADA and the Impact of Smart Grid
- SCADA Systems - Transitioning from Beginner to Advanced
- SCADA, IEC 61850 and Substation Automation workshop
- Uncertainty and Risk Management in Electricity Markets
- Modern Power System Analysis
- Reliability Centered Maintenance
- Demand Side Management
- Energy Markets Strategic Planning
- Economic Dispatch and Power System Planning
- Power Systems Planning and Operations
- Energy Trading and Energy Markets
- Energy Markets, Risk Assessment and Financial Management
- Reliability and Risk Applied to Physical Assets
- Economic Dispatch & Grid stability Constraints in Power Plants
- Power System State Estimation
- Communication Interfaces in Smart Grid
- Distributed Generation
- Distributed Wind Generation and its Impacts on the Network
- Modelling Analysis for Modern Electrical Systems
- Power Systems Economic Operation
- Reactive Power and Voltage Control on Electrical Networks
- Real Power & Control on Power System
- Substation Automation Systems
- Power System Reliability
- Power System Restoration
- Methodologies & Implementation Strategies
- Fundamentals of Power Systems





## COURSE OVERVIEW:

Electric power network is by far the largest machine built on the Earth. The requirement for round the clock electricity supply can only be met through involved operation, control and co-ordination and system protection strategy. It has recently been found that many major power grid blackouts occurred because protection mal operation. This requires fundamental understanding of the protection principle and relaying principle and their operating/blocking characteristics.

This week long intensive course on protection will cover the basic principle of protective relaying, current and voltage transformer. The theoretical aspect will be brief and tailored made for practicing engineers. The course will focus on the salient protection for important components in the system such as generator, motor, bus bar, transformer etc. The design of protection setting for every component will be explained through an example. The course is targeted for electrical design engineer for industry scale power network.

This course will address:

## BENEFITS:

The participants will have good grasp of various protection principles and knowledge about instrument transformers model and operation, specifications. They will be able to design protection system for motors, generators, transmission systems, transformers.



## COURSE INSTRUCTORS

### Dr. Bikash Pal



Prof Pal's research at Imperial College London over the last 19 years has focused on designing robust control techniques to guard against power system stability problem. He has led strategic research in power transmission control and state estimation at Imperial College London. His research has been primarily funded by research council, Engineering and Physical Research Council (EPSRC), UK, Council of the European Union and power industries: ABB, UK Power Networks and National Grid, UK. He has written one research monograph and one book in power system stability and control. He has published 75 IEEE/IET journal papers and graduated 18 PhDs and supervised 15 post docs.

He was with the faculty of IIT Kanpur before joining Imperial College London in 2001 where he is now a full Professor. Prof Pal graduated from Jadavpur University in India in 1990, obtained his Masters in 1992 from The Indian Institute of Science, Bangalore, India, and PhD in 1999 from Imperial College London.

Prof Pal is an ambassador of advanced multivariable control solutions to power system control and stability problems. He travels regularly to offer tutorials, industrial courses conference keynote speeches and DLP lectures in many IEEE Regions and Sections. His DLP lectures have benefited many colleagues in power engineering profession worldwide. As Editor-in-Chief (2005-2012) of IET Generation, Transmission and Distribution journal, he has demonstrated outstanding leadership in promoting high quality research from our power engineering colleagues. Currently he is Editor-in-Chief of IEEE Transactions on Sustainable Energy. He has been honoured by the German Research Foundation (DFG) with Mercator Professorship in 2011. Prof Pal was elevated to the grade of Fellow, IEEE for his contribution to power system stability and control in January 2013. He is a visiting Professor at Tsinghua University.

Prof Pal has offered course on power system stability and control and on power system protection entirely taken by the practicing engineers from Brazil, Mexico, Europe, Middle East and India in 2007, 2008, 2013, 2014 and 2016. In 2009 he trained power engineers from Power Grid Corporation of Bangladesh on reactive power and voltage control. In 2007, 2011 and 2013 he trained engineers from Calcutta Electric Supply Corporation, India and Tata consulting Engineers, India and West Bengal State Electricity Board and Power development Corporation on power system stability. In 2016 he trained faculty from NITs and power companies in India under Global Initiative of Academic Networks (GIAN). Prof Pal is technical consultant to National Grid UK and ALSTOM Grid UK and STATNET Norway, UK Power Networks where he provided technical solution power network stability related problem.

