Curriculum Vitae

ABDEL-MOAMEN MOHAMMED ABDEL-RAHIM

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A Dedicated and Creative Lecturer, Coordinator, Researcher & Trainer in the Field of Electrical Engineering and Mechatronic Dept. with Distinguished Academic & Interpersonal Skills in Teaching Electrical course, Computer science.

- **Creative** and **enthusiastic** Lecturer**,** Computer-**trainer** with **14** years' experience in the field of **Electrical Engineering**, **Computer** training, **conducting** training for different students & adults and **making** papers in the field of Electrical Engineering.
- Experience in **Lecturer** students in **Faculty of Engineering, Aswan University, Al-Azhar university and South Valley University.**
- Experience in **Preparing** Conferences, for Example MEPCON**.**
- **Good at** communicating with students, **solving problems**, and **making** decisions quickly.
- **12 years** experience in Conference Attendance as presenter for papers related to Electrical Engineering Dept.
- **22 years experience in the Electrical Engineering field.**
- **2 years experience as an Electrical Engineer in Ministry of Electricity & Energy, Aswan, Egypt.**
- **20 years teaching experience in the Electrical Engineering.**
- **Effective PowerPoint presentation.**
- **Improve efficiency and standardization by using personal computers.**

1-PERSONAL INFORMATION

Full Name: Abdel-Moamen Mohammed Abdel-Rahim Ahmed
Date of Birth: January, 10th, 1968.
Place of Birth: Egypt.
Nationality: Egyptian.
Marital Status: Married.
Present Job: Assistance Professor in Electrical Eng. Dept., Faculty of Energy Engineering, Aswan University.
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Second Language: English & Japanese
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2- EDUCATION

DEGREE	PLACE	DATES	COMMENTS
Ph.D. Electrical Engineering	**Indian Institute of Technology (IIT), Roorkee, INDIA**	**August 2004**	***Major*: Power System Analysis.** ***Minors*: Power Electronics.** ***Thesis Title:* *Optimal Power Flow with FACTS Devices.***
M.Sc. Electrical Engineering	**University of Assuit, EGYPT**	**May 1998**	***Major*: Automatic Control.** ***Minors*: Power System Analysis.** ***Thesis Title:* *Design of New Parametric Controller for Multi-Area Electric Energy System***
B.Sc. Electrical Engineering	**University of Assuit, EGYPT**	**June 1991**	***Very Good Degree***

3- JOB HISTORY

	POSITION	PLACE	DATES
1	Assistant Prof.	Electrical Engineering Dept., Faculty of Energy Engineering, Aswan University, Aswan, Egypt	March 17, 2013 - Present
2	Visiting Researcher	Graduate School of Science and Technology Frontier Technology for Electrical Energy, Kumamoto University, Japan	March 9, 2009- Sept 30, 2012
3.	Assistant Prof.	Electrical Engineering Dept., Faculty of Engineering, South Valley University, Qena, Egypt	July 2008 – March 16, 2013
4.	Vice Dean for Postgraduate and Research Affairs	Faculty of Energy Engineering, Aswan University, Aswan, Egypt	July 2007– June 2008
5.	Assistant Prof.	Faculty of Energy Engineering, Aswan University, Aswan, Egypt	Sept. 2004– June 2007
6.	Ph.D. candidate in Electrical Engineering	Indian Institute of Technology (IIT), Roorkee, INDIA	January 2000- August 2004
7	Lecturer	Electrical Engineering Dept., Faculty of Energy Engineering, Aswan University, Aswan, Egypt	August 1998- January 2000
8	Assistant Lecturer	Electrical Engineering Dept., Faculty of Energy Engineering, Aswan University, Aswan, Egypt	August 1993- August 1998
9	Electrical Engineer	Ministry of Electricity & Energy, Aswan, Egypt	June 1991- August 1993

4- *Teaching, Supervision and Evaluation*

a *Teaching*

- Training over than 8000 hours for many courses in Electrical Engineering Department. For Examples (Power system, Computer Control, Industrial Electronics, Machines, and so on)
- Working Over than 1000 hours in student laboratory for under and post graduates.
- Attending lectures given to demonstratives, assistant lecturers to develop my teaching skills.
- Planning and facilitating conferences at the Faculty (Reception and Organization Committee).
- Representing the Faculty in many workshops and conferences.
- Attending Faculty seminars on master degree and Ph. Degree in the field of Electrical Eng.

i) *Courses Taught (Undergraduate)*

- Automatic Control Theory.
- Industrial Power Electronics.
- Electrical Power Engineering
- Energy Utilization
- Elective Course (FACTS Devices).
- Power System Analysis (I, II)
- English Technical Writing
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ii) *Courses Taught (Graduate)*

- Industrial Power Electronics.
- Electrical Power (2).
- Energy Generation and Storage.
- Computer applications in electrical power network with MATLAB.
- Electrical Power and Machines.
  Electrical Lab Testing (I, II, III)

iii) *B. Sc Projects*

- Design of 220kV and 500kV UPS.
- Design Automatic Solar Radiation Tracker System for Photovoltaic Power System
- Design and Simulation of SVC and TCSC interconnected with smart grid.

b *Supervision*

- Currently Supervisor for Students doing Master of Science and Ph.D.in Electrical Engg.

c *Evaluation*

- External Examiner for Ph.D. Thesis Titled "**Application Evolutionary Optimization Techniques for** Artificial **Neural Networks to Power System Load Forecasting Problems**". by Mr. V. Rajasekaran, Madurai Kamaraj University, INDIA, 2008.
- External Examiner for Ph.D. Thesis Titled "**Investigations on Power System Operation and Management in Restructured Market**". by Mrs. R. Pondicherry Engineering College Pondicherry - 605 014, INDIA, 2011.

5 •RESEARCHE •

a Areas

- Application of Power Electronics in Power Systems.
- Simulation, Modeling and Analysis of FACTS Controllers in Power Systems.
- Power Flow & Optimal Power Flow Incorporating FACTS Devices.
- Digital Protection of Power System Using MATLAB.

b Publications

1. **Shazly A. Mohammed, Aurelio G. Cerrada, Abdel-Moamen M. A, and B. Hasanin "Conventional Dynamic Voltage Restorer (DVR) for Mitigation of Voltage Sag in Power Distribution Systems" International Journal of Advances in Engineering & Technology, IJAET ISSN: 2231-1963 Vol. 6, Issue 1, pp. 415-425, March 2013.**

2. **Shazly A. Mohammed, Aurelio G. Cerrada, Abdel-Moamen M. A, and B. Hasanin "Dynamic Voltage Restorer (DVR) System for Compensation of Voltage Sags, State-of-the-Art Review"International Journal Of Computational Engineering Research (IJCER) Vol. 3 Issue. 1 pp 177-183, January 2013.**

3. **Mohamed T. H., Abdel Moamen M.A., Hassan A. A., Hiyama T. "Wide-Area Power System Oscillation Damping using Model Predictive Control Technique" IEEJ Transaction in Power & Energy, Vol.131 No.7, pp.536-541, 2011.**

4. **Abdel Moamen M.A. "Newton-Raphson UPFC Model for Power Flow Solution with Different Types of Load Models" International Middle East Power System Conference MEPCON, Cairo, Egypt, 2010.**

5. **Abdel Moamen M.A. "Newton-Raphson SVC Model for Power Flow Solution with Different Types of Load Models" International Middle East Power System Conference MEPCON, Assuit, Egypt, 2009.**

6. **Narayan Prasad Padhy, Abdel Moamen, M.A. "A Generalized Newton's Optimal Power Flow Modeling with FACTS Devices" International Journal of Modeling and Simulation - ISSN: 0228-6203 , Vol 28; No 3, pp. 229-238, 2008.**

7. **Narayan Prasad Padhy, Abdel Moamen, M.A. "Optimal Placement of FACTS Devices for Practical Utilities" International Journal of Power and Energy Systems, Vol. 27; No 2, pp. 193-204, 2007.**

8. **Abdel Moamen, M.A. and Narayan Parsad Padhy, "Optimal Power Flow Model with TCSC for Practical Power Networks", International Journal of Power and Energy Systems, ISSN: 1078-3466, Vol.26, No.1, Jan 2006.**

9. **Narayana Prasad Padhy and Abdel Moamen, M.A., "Power Flow Control and Solutions with Multiple and Multi type FACTS Devices", International Journal of Electric Power System Research, ISSN: 0378-7796, Vol.74, pp 341-351, June 2005.**

10. **Abdel Moamen, M.A. and Narayan Prasad, Padhy, "Multi-Objective Optimal Power Flow Model With TCSC for Practical Power Networks", IEEE Power Engineering Society General meetings, pp 686-690, June 2004.**

11. **Abdel Moamen, M.A. and Narayan Prasad, Padhy, "Newton-Raphson UPFC Model for Power Flow Solution of Practical power Networks with Sparse Techniques", Proceedings of the 2004 IEEE International Conference on Electric Utility Deregulation, Restructuring and Power Technologies (DRPT), Vol.1, pp 77-83, Apr 2004.**

12. **Padhy Narayana Prasad, Abdel Moamen, M.A. and B.J. Praveen Kumar, "Optimal Location and Initial Parameter Settings of Multiple TCSCs for Reactive Power Planning using genetic Algorithms", IEEE Power Engineering Society General Meetings, pp 1110-1114, June 2004.**

13. Padhy Narayana Prasad, Abdel Moamen, M.A. and B.J. Praveen Kumar, "A Hybrid Optimal Reactive Power Planning Algorithm Using TCSC", Proc. Of NPSC-2004, pp 182-187, 2004.

14. Narayan Prasad Padhy, Abdel Moamen, M.A. and Gupta, A.K., "Optimal Placement of TCSC Based on Improved Power Transfer and Minimum Transmission Losses", Journal of International Association on Electric generation, Transmission and Distribution (*Afro-Asian Region*), Vol.-11-13, 2003.

15. Abdel Moamen, M.A. and Narayan Prasad, Padhy, "Power Flow Control and Transmission Loss Minimization Model with TCSC for Practical Power Networks" Power Engineering Society General Meeting, IEEE Vol. 2, ISSN: ISBN: 0-7803-7989-6 13-17 July 2003.

16. Abdel Moamen, M.A. and Narayan Prasad, Padhy; 'Optimal Power Flow Incorporating FACTS Devices- Bibliography and Survey' Transmission and Distribution Conference and Exposition, IEEE PES Vol 2, ISSN: ISBN: 0-7803-8110-6 pp. 669-676 vol.2, Sept. 2003.

17. Narayan Prasad Padhy, Sood, Y.R., Abdel Moamen, M.A. Murthi Kumar, Gupta, H.O., "A Hybrid Model for Congestion Management With real and Reactive Power Transactions", Proceedings of IEEE Summer Meeting Vol 3, pp. 1366 – 1372, July 2002.

18. Abdel Moamen, M.A. and Narayan Prasad Padhy, "Newton-Raphson TCSC Model for Power Flow Solutions of Practical Power Networks", Proceedings of IEEE Summer Meeting vol.3, pp. 1488 – 1493, July 2002.

19. Abdel Moamen, M.A. and Narayan Prasad Padhy, "Optimal Power Flow Incorporating FACTS Devices", Proceedings of the International Conference on Computer Applications in Electrical Engineering *CEERA*, pp. 149-158, February 2002.

20. Padhy Narayana Prasad, Abdel Moamen, M.A.; Trivedi, P.K.; Das, B.; "A Hybrid Model for Optimal Power Flow Incorporating FACTS Devices", Power Engineering Society Winter Meeting, IEEE Volume 2, pp. 510 – 515, Vol.2, 28 Jan.-1 Feb. 2001.

21. Amin M. H., Adel B. A. and Abdel Moamen M. A. "Robust Load Frequency Controller with Uncertainties Parameters" Middle East Power System Conference MEPCON, Mansora, Egypt, 1997.

Optimal Power Flow with FACTS Devices

Abdel-Moamen Mohammed Abdel-Rahim Ahmed

In the present day scenario, transmission systems are becoming increasingly stressed, more difficult to operate, and more insecure with unscheduled power flows and higher losses because of growing demand and tight restrictions on the construction of new lines. Power flows in some of the transmission lines are well bel ow their thermal limits, while certain lines are overloaded, which has an overall effect of deteriorating voltage profiles and decreasing system stability and security. However, many high-voltage systems are operating below their thermal ratings due to constraints such as voltage and transient stability limits. In addition, existing traditional transmission facilities, in most cases, are not designed to handle the control requirements of complex, highly interconnected power systems. This overall situation requires the review of traditional transmission methods and practices and the creation of new concepts which would allow the use of existing generation and transmission lines up to their full capabilities without reduction in system stability and security. Another reason that is forcing the review of traditional transmission methods is the tendency of modern power systems to follow the changes in today's global economy that are leading to deregulation of electrical power markets in order to stimulate competi tion between utilities.

In the past, control of power systems was aided by mechanical devices and actions. This came at the expense of providing greater operating margins and redundancies. The rapid development of power electronics has made it possible to design power electronic equipment of high rating for high voltage systems, the voltage stability problem resulting from transmission system may be, at least partly, improved by use of the equipment well-known as Flexible AC Transmission Systems (FACTS) controllers.

However, the use of FACTS devices makes inherent FACTS device resources available, thus improving power system control and operating margins. In addition, some of the undesirable effects of interconnected power systems can be mitigated by the use of FACTS devices. Increased demands on the transmission system, absences of long term planning and the drive towards transmission open access (TOA) have adversely affected security and quality of supply. However, with FACTS devices, it is now also possible to exercise better control of the grid and to facilitate transmission transactions, such as wheeling. With such devices, it is possible to control the path and flow of active and reactive power separately, and to join weakly interconnected systems amongst others. The use of such devices leads to better reliability and availability of power, while reducing risk and flattening the demand curve.

The new power system modeling is required to be modified with the incorporation of FACTS devices accordingly. So this research analyzes emerging issues, in the field of power flow and optimal power flow incorporating FACTS devices after determining their optimal locations. By using FACTS devices, new control variables and control objective equations are usually added in conventional power flow and optimal power flow equations. Finally, a generalized power flow and optimal power flow (OPF) model with multiple and multi-type FACTS will be a great help to modern power systems.

In this research, the optimal power flow with FACTS devices problem is studied. The following achievements can be concluded:

- A new current injection model of the modified power system using Newton Raphson method for desired power transfer has been proposed. Therefore whole system with these devices can be easily translated to power injection models without change of original admittance and the Jacobian matrices.
- Optimal placement of single and multiple FACTS devices are considered using both sensitivity analysis and Genetic Algorithm.
- A fully-fledged optimal power flow incorporating FACTS devices algorithm using Newton's method has been developed and validated.
- A firing angle-based thyristor controlled series capacitor (TCSC) model, a coordinated two-voltage source unified power flow controller (UPFC) model, generalized unified power flow controller (GUPFC) model and an interline power flow controller (IPFC) models are presented.
    - The ability of the optimal power flow with FACTS devices (OPF-FACTS) algorithm to solve networks with a mix of power flow controllers is also shown for IEEE test systems and practical Uttar Pradesh State Electricity Board (UPSEB) Indian Utility system.

7- REFEREES

Name	Address	contact numbers *e-mail* address
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DATE: March 19th 2013